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# **AnyBlok Documentation**

***Release 0.9.3***

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AnyBlok is a Python framework allowing to create highly dynamic and modular applications on top of SQLAlchemy. Applications are made of “bloks” that can be installed, extended, replaced, upgraded or uninstalled. Bloks can provide SQL Models, Column types, Fields, Mixins, SQL views, or plain Python code unrelated to the database. Models can be dynamically customized, modified, or extended without strong dependencies between them, just by adding new bloks. Bloks are declared using *setuptools* entry-points.

AnyBlok is released under the terms of the *Mozilla Public License*.

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## Front Matter

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Information about the AnyBlok project.

### 1.1 Project Homepage

AnyBlok is hosted on [github](#) - the main project page is at <http://github.com/AnyBlok/AnyBlok> or <http://code.anyblok.org>. Source code is tracked here using [GIT](#).

Releases and project status are available on Pypi at <http://pypi.python.org/pypi/anyblok>.

The most recent published version of this documentation should be at <http://doc.anyblok.org>.

### 1.2 Project Status

AnyBlok is currently in alpha status and is expected to be fairly stable. Users should take care to report bugs and missing features on an as-needed basis. It should be expected that the development version may be required for proper implementation of recently repaired issues in between releases; the latest master is always available at <https://github.com/AnyBlok/AnyBlok/archive/master.zip>.

### 1.3 Installation

Install released versions of AnyBlok from the Python package index with [pip](#) or a similar tool:

```
pip install anyblok
```

Installation via source distribution is via the `setup.py` script:

```
python setup.py install
```

Installation will add the `anyblok` commands to the environment.

---

**Note:** AnyBlok use Python version  $\geq 3.3$

---

## 1.4 Unit Test

Run the framework test with `nose`:

```
pip install nose
nosetests anyblok/tests
```

Run all the installed bloks:

```
anyblok_nose -c config.file.cfg
```

Run the blok tests at the installation:

```
anyblok_updatedb -c config.file.cfg --install_bloks myblok --test-blok-at-install
```

AnyBlok is tested using [Travis](#)

## 1.5 Dependencies

AnyBlok works with **Python 3.3** and later. The install process will ensure that [SQLAlchemy](#), [Alembic](#), [SQLAlchemy-Utils](#) are installed, in addition to other dependencies.

AnyBlok works with SQLAlchemy from version **1.0.11**, Alembic from version **0.8.4** and SQLAlchemy-Utils from version **0.31.4**. The latest version of them is strongly recommended.

## 1.6 Contributing (hackers needed!)

Anyblok is at a very early stage, feel free to fork, talk with core dev, and spread the word!

## 1.7 Author

Jean-Sébastien Suzanne

## 1.8 Contributors

[Anybox](#) team:

- Georges Racinet
- Christophe Combelles
- Jean-Sébastien Suzanne
- Florent Jouatte
- Simon André
- Pierre Verkest

other:

- Sébastien Chazallet
- Franck Bret

## 1.9 Bugs

Bugs and feature enhancements to AnyBlok should be reported on the [Issue tracker](#).

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## How to create your own application

---

This first part introduces how to create an application with his code. Why do we have to create an application ? Because AnyBlok is just a framework not an application.

The goal is that more than one application can use the same database for different usage. The web server needs to give access to the user, but a profiler needs another access with another access rule, or another application needs to provide one part of the fonctionnalités.

We will write a simple application that connects to a new empty database:

- **Employee**
  - name: employee's name
  - office (Room): the room where the employee works
  - position: employee position (manager, developer...)
- **Room**
  - number: describe the room in the building
  - address: postal address
  - employees: men and women working in that room
- **Address**
  - street
  - zipcode
  - city
  - rooms: room list
- **Position**
  - name: position name

### 2.1 Declare bloks in the entry points

A blok must be declared in a `setuptools` entry point named **bloks**.

File tree:

```
WorkBlok
-- setup.py
```

We declare 4 bloks in the `setup.py` file that we will define explain after:

```
bloks = [  
    'office=exampleblok.office_blok:OfficeBlok',  
    'employee=exampleblok.employee_blok:EmployeeBlok',  
    'position=exampleblok.position_blok:PositionBlok',  
    'employee-position=exampleblok.employee_position_blok:EmployeePositionBlok',  
],  
  
setup(  
    # (...)  
    entry_points={  
        'bloks': bloks,  
    },  
)
```

## 2.2 Create Bloks

A blok contains Declarations such as:

- Model: a Python class usable by the application and linked in the registry
- Mixin: a Python class to extend Model
- Column: a Python class, describing an sql column type
- Relationship: a Python class, allowing to surh on the join on the model data
- ...

The blok name must be declared in the blok group of the `setup.py` file of the distribution as explain before.

And the blok must inherit the Blok class of anyblok in the `__init__.py` file of a package:

```
from anyblok.blok import Blok  
  
class MyFirstBlok(Blok):  
    """ This is valid blok """
```

The blok class must be in the init file of the package so that all modules and sub-packages which have declarations have to be imported by anyblok, in the `import_declaration_module` method

### Office blok

File tree:

```
office_blok  
-- __init__.py  
-- office.py
```

`__init__.py` file:

```
from anyblok.blok import Blok  
  
class OfficeBlok(Blok):  
  
    version = '1.0.0'  
  
    def install(self):
```

```

""" method called at blok installation time """
address = self.registry.Address.insert(street='14-16 rue Soleillet',
                                       zip='75020', city='Paris')
self.registry.Room.insert(number=308, address=address)

def update(self, latest_version):
    if latest_version is None:
        self.install()

@classmethod
def import_declaration_module(cls):
    from . import office # noqa

# office.py describe the models Address and Room

```

### Position blok

File tree:

```

position_blok
-- __init__.py
-- position.py

```

`__init__.py` file:

```

from anyblok.blok import Blok

class PositionBlok(Blok):

    version = '1.0.0'

    def install(self):
        self.registry.Position.multi_insert({'name': 'CTO'},
                                           {'name': 'CEO'},
                                           {'name': 'Administrative Manager'},
                                           {'name': 'Project Manager'},
                                           {'name': 'Developer'})

    def update(self, latest_version):
        if latest_version is None:
            self.install()

    @classmethod
    def import_declaration_module(cls):
        from . import position # noqa

# position.py describe the model Position

```

### Employee blok

Some bloks can have requirements. Each blok define its dependencies:

- required: required bloks must be loaded before
- optional: If the blok exists, optional bloks will be loaded

A blok can be declared as `autoinstall` if the blok is not installed upon the loading of the registry, then this blok will be loaded and installed.

File tree:

```
employee_blok
-- __init__.py
-- config.py
-- employee.py
```

`__init__.py` file:

```
from anyblok.blok import Blok

class EmployeeBlok(Blok):

    version = '1.0.0'
    autoinstall = True

    required = [
        'office',
    ]

    optional = [
        'position',
    ]

    def install(self):
        room = self.registry.Room.query().filter(
            self.registry.Room.number == 308).first()
        employees = [dict(name=employee, room=room)
                      for employee in ('Georges Racinet',
                                      'Christophe Combelles',
                                      'Sandrine Chaufournais',
                                      'Pierre Verkest',
                                      'Franck Bret',
                                      "Simon André",
                                      'Florent Jouatte',
                                      'Clovis Nzouendjou',
                                      u"Jean-Sébastien Suzanne")]

        self.registry.Employee.multi_insert(*employees)

    def update(self, latest_version):
        if latest_version is None:
            self.install()

    @classmethod
    def import_declaration_module(cls):
        from . import config # noqa
        from . import employee # noqa

# employee.py describe the model Employee
```

### EmployeePosition blok:

Some bloks can be installed when other bloks are installed, they are called conditional bloks.

File tree:

```
employee_position_blok
-- __init__.py
-- employee.py
```

`__init__.py` file:



```

from anyblok.blok import Blok

class EmployeePositionBlok(Blok):

    version = '1.0.0'
    priority = 200

    conditional = [
        'employee',
        'position',
    ]

    def install(self):
        Employee = self.registry.Employee

        position_by_employee = {
            'Georges Racinet': 'CTO',
            'Christophe Combelles': 'CEO',
            'Sandrine Chauffournais': u"Administrative Manager",
            'Pierre Verkest': 'Project Manager',
            'Franck Bret': 'Project Manager',
            u"Simon André": 'Developer',
            'Florent Jouatte': 'Developer',
            'Clovis Nzouendjou': 'Developer',
            u"Jean-Sébastien Suzanne": 'Developer',
        }

        for employee, position in position_by_employee.items():
            Employee.query().filter(Employee.name == employee).update({
                'position_name': position})

    def update(self, latest_version):
        if latest_version is None:
            self.install()

    @classmethod
    def import_declaration_module(cls):
        from . import employee # noqa

```

**Warning:** There are no strong dependencies between conditional blok and bloks, so the priority number of the conditional blok must be bigger than bloks defined in the *conditional* list. Bloks are loaded by dependencies and priorities so a blok with small dependency/priority will be loaded before a blok with an higher dependency/priority.

## 2.3 Create Models

The Model must be added under the Model node of the declaration with the class decorator `Declarations.register`:

```

from anyblok import Declarations

@Declarations.register(Declarations.Model)
class AAnyBlokModel:
    """ The first Model of our application """

```

There are two types of Model:

- SQL: Create a table in the database (inherit `SqlBase` and `Base`)
- Non SQL: No table but the model exists in the registry and can be used (inherits `Base`).

`SqlBase` and `Base` are core models. Directly calling them is not allowed. But they are inheritable and each sub-class is propagated to all the anyblok models. This example uses `insert` and `multi_insert` added by the `anyblok-core` blok.

An SQL model can define columns:

```
from anyblok import Declarations
from anyblok.column import String

register = Declarations.register
Model = Declarations.Model

@register(Model)
class ASQLModel:

    acolumn = String(label="The first column", primary_key=True)
```

**Warning:** Any SQL Model must have a primary key composed with one or more columns.

**Warning:** The table name depends on the registry tree. Here the table is `asqlmodel`. If a new model is defined under `ASQLModel` (example `UnderModel: asqlcolumn_undermodel`), the registry model will be stored as `Model.ASQLModel.UnderModel`

`office_blok.office:`

```
from anyblok import Declarations
from anyblok.column import Integer, String
from anyblok.relationship import Many2One

register = Declarations.register
Model = Declarations.Model

@register(Model)
class Address:

    id = Integer(label="Identifier", primary_key=True)
    street = String(label="Street", nullable=False)
    zip = String(label="Zip", nullable=False)
    city = String(label="City", nullable=False)

    def __str__(self):
        return "%s %s %s" % (self.street, self.zip, self.city)

@register(Model)
class Room:

    id = Integer(label="Identifier", primary_key=True)
    number = Integer(label="Number of the room", nullable=False)
    address = Many2One(label="Address", model=Model.Address, nullable=False,
```

```

        one2many="rooms")

    def __str__(self):
        return "Room %d at %s" % (self.number, self.address)

```

The relationships can also define the opposite relation. Here the address Many2One relation also declares the room One2Many relation on the Address Model

A Many2One or One2One relationship must have an existing column. The `column_name` attribute allows to choose the linked column, if this attribute is missing then the value is `“model.table”.remote_column`” If the linked column does not exist, the relationship creates the column with the same type as the `remote_column`.

**position\_blok.position:**

```

from anyblok import Declarations
from anyblok.column import String

register = Declarations.register
Model = Declarations.Model

@register(Model)
class Position:

    name = String(label="Position", primary_key=True)

    def __str__(self):
        return self.name

```

**employee\_blok.employee:**

```

from anyblok import Declarations
from anyblok.column import String
from anyblok.relationship import Many2One

register = Declarations.register
Model = Declarations.Model

@register(Model)
class Employee:

    name = String(label="Number of the room", primary_key=True)
    room = Many2One(label="Office", model=Model.Room, one2many="employees")

    def __str__(self):
        return "%s in %s" % (self.name, self.room)

```

## 2.4 Updating an existing Model

If you create 2 models with the same declaration position and the same name, the second model will subclass the first model. The two models will be merged to get the real model

**employee\_position\_blok.employee:**

```

from anyblok import Declarations
from anyblok.relationship import Many2One

```

```
register = Declarations.register
Model = Declarations.Model

@register(Model)
class Employee:

    position = Many2One(label="Position", model=Model.Position, nullable=False)

    def __str__(self):
        res = super(Employee, self).__str__()
        return "%s (%s)" % (res, self.position)
```

## 2.5 Add entries in the argparse configuration

Some applications may require options. Options are grouped by category. And the application chooses the option category to display.

**employee\_blok.config:**

```
from anyblok.config import Configuration

@Configuration.add('message', label="This is the group message")
def add_interpreter(parser, configuration):
    parser.add_argument('--message-before', dest='message_before')
    parser.add_argument('--message-after', dest='message_after')
```

## 2.6 Create an application

The application can be a simple script or a setuptools script. For a setuptools script, add this in the `setup.py`:

```
setup(
    ...
    entry_points={
        'console_scripts': ['exampleblok=exampleblok.scripts:exampleblok'],
        'bloks': bloks,
    },
)
```

The script must display:

- the provided `message_before`
- the lists of the employee by address and by room
- the provided `message_after`

**scripts.py:**

```
import anyblok
from logging import getLogger
from anyblok.config import Configuration

logger = getLogger()
```

```
def exampleblok():
    # Initialise the application, with a name and a version number
    # select the groupe of options to display
    # return a registry if the database are selected
    registry = anyblok.start(
        'Example Blok', argparse_groups=['message', 'logging'])

    if not registry:
        return

    message_before = Configuration.get('message_before')
    message_after = Configuration.get('message_after')

    if message_before:
        logger.info(message_before)

    for address in registry.Address.query().all():
        for room in address.rooms:
            for employee in room.employees:
                logger.info(employee)

    if message_after:
        logger.info(message_after)
```

#### Display the help of your application:

```
jssuzanne:anyblok jssuzanne$ ./bin/exampleblok -h
usage: exampleblok [-h]
                  [--logging-level {NOTSET,DEBUG,INFO,WARNING,ERROR,CRITICAL}]
                  [--logging-level-qualnames LOGGING_LEVEL_QUALNAMES [LOGGING_LEVEL_QUALNAMES ...]]
                  [--logging-config-file LOGGING_CONFIGFILE]
                  [--logging-json-config-file JSON_LOGGING_CONFIGFILE]
                  [--logging-yaml-config-file YAML_LOGGING_CONFIGFILE]
                  [-c CONFIGFILE] [--without-auto-migration]
                  [--db-name DB_NAME] [--db-driver-name DB_DRIVER_NAME]
                  [--db-user-name DB_USER_NAME] [--db-password DB_PASSWORD]
                  [--db-host DB_HOST] [--db-port DB_PORT] [--db-echo]

[options] -- other arguments

optional arguments:
  -h, --help            show this help message and exit
  -c CONFIGFILE          Relative path of the config file
  --without-auto-migration

Logging:
  --logging-level {NOTSET,DEBUG,INFO,WARNING,ERROR,CRITICAL}
  --logging-level-qualnames LOGGING_LEVEL_QUALNAMES [LOGGING_LEVEL_QUALNAMES ...]
                        Limit the log level on a qualnames list
  --logging-config-file LOGGING_CONFIGFILE
                        Relative path of the logging config file
  --logging-json-config-file JSON_LOGGING_CONFIGFILE
                        Relative path of the logging config file (json). Only
                        if the logging config file doesn't filled
  --logging-yaml-config-file YAML_LOGGING_CONFIGFILE
                        Relative path of the logging config file (yaml). Only
                        if the logging and json config file doesn't filled
```

```

Database:
--db-name DB_NAME      Name of the database
--db-driver-name DB_DRIVER_NAME
                        the name of the database backend. This name will
                        correspond to a module in sqlalchemy/databases or a
                        third party plug-in
--db-user-name DB_USER_NAME
                        The user name
--db-password DB_PASSWORD
                        database password
--db-host DB_HOST      The name of the host
--db-port DB_PORT      The port number
--db-echo

```

### Create an empty database and call the script:

```

jssuzanne:anyblok jssuzanne$ createdb anyblok
jssuzanne:anyblok jssuzanne$ ./bin/exampleblok -c anyblok.cfg --message-before "Get the employee ..."
2014-11-29 10:54:27 INFO - anyblok:root - Registry.load
2014-11-29 10:54:27 INFO - anyblok:anyblok.registry - Blok 'anyblok-core' loaded
2014-11-29 10:54:27 INFO - anyblok:anyblok.registry - Assemble 'Model' entry
2014-11-29 10:54:27 INFO - anyblok:alembic.migration - Context impl PostgresqlImpl.
2014-11-29 10:54:27 INFO - anyblok:alembic.migration - Will assume transactional DDL.
2014-11-29 10:54:27 INFO - anyblok:alembic.ddl.postgresql - Detected sequence named 'system_cache_id_seq' as
2014-11-29 10:54:27 INFO - anyblok:anyblok.registry - Initialize 'Model' entry
2014-11-29 10:54:27 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Install the k
2014-11-29 10:54:27 INFO - anyblok:root - Registry.reload
2014-11-29 10:54:27 INFO - anyblok:root - Registry.load
2014-11-29 10:54:27 INFO - anyblok:anyblok.registry - Blok 'anyblok-core' loaded
2014-11-29 10:54:27 INFO - anyblok:anyblok.registry - Blok 'office' loaded
2014-11-29 10:54:27 INFO - anyblok:anyblok.registry - Assemble 'Model' entry
2014-11-29 10:54:27 INFO - anyblok:alembic.migration - Context impl PostgresqlImpl.
2014-11-29 10:54:27 INFO - anyblok:alembic.migration - Will assume transactional DDL.
2014-11-29 10:54:27 INFO - anyblok:alembic.ddl.postgresql - Detected sequence named 'address_id_seq' a
2014-11-29 10:54:27 INFO - anyblok:alembic.ddl.postgresql - Detected sequence named 'system_cache_id_s
2014-11-29 10:54:27 INFO - anyblok:alembic.ddl.postgresql - Detected sequence named 'room_id_seq' as c
2014-11-29 10:54:27 INFO - anyblok:anyblok.registry - Initialize 'Model' entry
2014-11-29 10:54:28 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Install the k
2014-11-29 10:54:28 INFO - anyblok:root - Registry.reload
2014-11-29 10:54:28 INFO - anyblok:root - Registry.load
2014-11-29 10:54:28 INFO - anyblok:anyblok.registry - Blok 'anyblok-core' loaded
2014-11-29 10:54:28 INFO - anyblok:anyblok.registry - Blok 'office' loaded
2014-11-29 10:54:28 INFO - anyblok:anyblok.registry - Blok 'position' loaded
2014-11-29 10:54:28 INFO - anyblok:anyblok.registry - Assemble 'Model' entry
2014-11-29 10:54:28 INFO - anyblok:alembic.migration - Context impl PostgresqlImpl.
2014-11-29 10:54:28 INFO - anyblok:alembic.migration - Will assume transactional DDL.
2014-11-29 10:54:28 INFO - anyblok:alembic.ddl.postgresql - Detected sequence named 'address_id_seq' a
2014-11-29 10:54:28 INFO - anyblok:alembic.ddl.postgresql - Detected sequence named 'system_cache_id_s
2014-11-29 10:54:28 INFO - anyblok:alembic.ddl.postgresql - Detected sequence named 'room_id_seq' as c
2014-11-29 10:54:28 INFO - anyblok:anyblok.registry - Initialize 'Model' entry
2014-11-29 10:54:28 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Install the k
2014-11-29 10:54:28 INFO - anyblok:root - Registry.reload
2014-11-29 10:54:28 INFO - anyblok:root - Registry.load
2014-11-29 10:54:28 INFO - anyblok:anyblok.registry - Blok 'anyblok-core' loaded
2014-11-29 10:54:28 INFO - anyblok:anyblok.registry - Blok 'office' loaded
2014-11-29 10:54:28 INFO - anyblok:anyblok.registry - Blok 'position' loaded
2014-11-29 10:54:28 INFO - anyblok:anyblok.registry - Blok 'employee' loaded
2014-11-29 10:54:28 INFO - anyblok:anyblok.registry - Assemble 'Model' entry

```

```

2014-1129 10:54:28 INFO - anyblok:alembic.migration - Context impl PostgresqlImpl.
2014-1129 10:54:28 INFO - anyblok:alembic.migration - Will assume transactional DDL.
2014-1129 10:54:28 INFO - anyblok:alembic.ddl.postgresql - Detected sequence named 'system_cache_id_s
2014-1129 10:54:28 INFO - anyblok:anyblok.registry - Initialize 'Model' entry
2014-1129 10:54:29 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Install the k
2014-1129 10:54:29 INFO - anyblok:root - Registry.reload
2014-1129 10:54:29 INFO - anyblok:root - Registry.load
2014-1129 10:54:29 INFO - anyblok:anyblok.registry - Blok 'anyblok-core' loaded
2014-1129 10:54:29 INFO - anyblok:anyblok.registry - Blok 'office' loaded
2014-1129 10:54:29 INFO - anyblok:anyblok.registry - Blok 'position' loaded
2014-1129 10:54:29 INFO - anyblok:anyblok.registry - Blok 'employee' loaded
2014-1129 10:54:29 INFO - anyblok:anyblok.registry - Blok 'employee-position' loaded
2014-1129 10:54:29 INFO - anyblok:anyblok.registry - Assemble 'Model' entry
2014-1129 10:54:29 INFO - anyblok:alembic.migration - Context impl PostgresqlImpl.
2014-1129 10:54:29 INFO - anyblok:alembic.migration - Will assume transactional DDL.
2014-1129 10:54:29 INFO - anyblok:alembic.ddl.postgresql - Detected sequence named 'system_cache_id_s
2014-1129 10:54:29 INFO - anyblok:alembic.autogenerate.compare - Detected added column 'employee.posi
2014-1129 10:54:29 WARNING - anyblok:anyblok.migration - (IntegrityError) column "position_name" cont
'ALTER TABLE employee ALTER COLUMN position_name SET NOT NULL' {}
2014-1129 10:54:29 INFO - anyblok:anyblok.registry - Initialize 'Model' entry
2014-1129 10:54:29 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Install the k
2014-1129 10:54:30 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Load the blo
2014-1129 10:54:30 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Load the blo
2014-1129 10:54:30 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Load the blo
2014-1129 10:54:30 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Load the blo
2014-1129 10:54:30 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Load the blo
2014-1129 10:54:30 INFO - anyblok:exampleblok.scripts - Get the employee ...
2014-1129 10:54:30 INFO - anyblok:exampleblok.scripts - Sandrine Chaufournaïs in Room 308 at 14-16 ru
2014-1129 10:54:30 INFO - anyblok:exampleblok.scripts - Christophe Combelles in Room 308 at 14-16 rue
2014-1129 10:54:30 INFO - anyblok:exampleblok.scripts - Clovis Nzouendjou in Room 308 at 14-16 rue So
2014-1129 10:54:30 INFO - anyblok:exampleblok.scripts - Florent Jouatte in Room 308 at 14-16 rue Sole
2014-1129 10:54:30 INFO - anyblok:exampleblok.scripts - Simon André in Room 308 at 14-16 rue Soleille
2014-1129 10:54:30 INFO - anyblok:exampleblok.scripts - Jean-Sébastien Suzanne in Room 308 at 14-16 r
2014-1129 10:54:30 INFO - anyblok:exampleblok.scripts - Georges Racinet in Room 308 at 14-16 rue Sole
2014-1129 10:54:30 INFO - anyblok:exampleblok.scripts - Pierre Verkest in Room 308 at 14-16 rue Sole
2014-1129 10:54:30 INFO - anyblok:exampleblok.scripts - Franck Bret in Room 308 at 14-16 rue Soleille
2014-1129 10:54:30 INFO - anyblok:exampleblok.scripts - End ...

```

The registry is loaded twice:

- The first load installs the bloks anyblok-core, office, position and employee
- The second load installs the conditional blok employee-position and runs a migration to add the field employee\_name

Call the script again:

```

jssuzanne:anyblok jssuzanne$ ./bin/exampleblok -c anyblok.cfg --message-before "Get the employee ..."
2014-1129 10:57:52 INFO - anyblok:root - Registry.load
2014-1129 10:57:52 INFO - anyblok:anyblok.registry - Blok 'anyblok-core' loaded
2014-1129 10:57:52 INFO - anyblok:anyblok.registry - Blok 'office' loaded
2014-1129 10:57:52 INFO - anyblok:anyblok.registry - Blok 'position' loaded
2014-1129 10:57:52 INFO - anyblok:anyblok.registry - Blok 'employee' loaded
2014-1129 10:57:52 INFO - anyblok:anyblok.registry - Blok 'employee-position' loaded
2014-1129 10:57:52 INFO - anyblok:anyblok.registry - Assemble 'Model' entry
2014-1129 10:57:52 INFO - anyblok:alembic.migration - Context impl PostgresqlImpl.
2014-1129 10:57:52 INFO - anyblok:alembic.migration - Will assume transactional DDL.
2014-1129 10:57:52 INFO - anyblok:alembic.ddl.postgresql - Detected sequence named 'system_cache_id_s
2014-1129 10:57:52 INFO - anyblok:alembic.autogenerate.compare - Detected NOT NULL on column 'employe

```

```
2014-11-29 10:57:52 INFO - anyblok:anyblok.registry - Initialize 'Model' entry
2014-11-29 10:57:52 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Load the blok
2014-11-29 10:57:52 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Load the blok
2014-11-29 10:57:52 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Load the blok
2014-11-29 10:57:52 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Load the blok
2014-11-29 10:57:52 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Load the blok
2014-11-29 10:57:52 INFO - anyblok:exampleblok.scripts - Get the employee ...
2014-11-29 10:57:52 INFO - anyblok:exampleblok.scripts - Sandrine Chaufournaïs in Room 308 at 14-16 rue
2014-11-29 10:57:52 INFO - anyblok:exampleblok.scripts - Christophe Combelles in Room 308 at 14-16 rue
2014-11-29 10:57:52 INFO - anyblok:exampleblok.scripts - Clovis Nzouendjou in Room 308 at 14-16 rue Sole
2014-11-29 10:57:52 INFO - anyblok:exampleblok.scripts - Florent Jouatte in Room 308 at 14-16 rue Sole
2014-11-29 10:57:52 INFO - anyblok:exampleblok.scripts - Simon André in Room 308 at 14-16 rue Soleille
2014-11-29 10:57:52 INFO - anyblok:exampleblok.scripts - Jean-Sébastien Suzanne in Room 308 at 14-16 rue
2014-11-29 10:57:52 INFO - anyblok:exampleblok.scripts - Georges Racinet in Room 308 at 14-16 rue Sole
2014-11-29 10:57:52 INFO - anyblok:exampleblok.scripts - Pierre Verkest in Room 308 at 14-16 rue Sole
2014-11-29 10:57:52 INFO - anyblok:exampleblok.scripts - Franck Bret in Room 308 at 14-16 rue Soleille
2014-11-29 10:57:52 INFO - anyblok:exampleblok.scripts - End ...
```

The registry is loaded only once, because the bloks are already installed

## 2.7 Generic application of AnyBlok

Anyblok provides some console script to help :

- `anyblok_createdb`
- `anyblok_updatedb`
- `anyblok_interpreter` .. note:

```
if IPython is in the sys.modules then the interpreter is an IPython interpreter
```

- `anyblok_nose` (nose test)

TODO: I know it's not a setuptools documentation but it could be kind to show a complete minimalist exemple of *setup.py* with requires (to anyblok). We could also display the full tree from root

A direct link to download the full working example.

## 2.8 AnyBlok plugin for nosetests

You can test your bloks in your anyblok distribution with nose. use the option `-with-anyblok-bloks`. The plugin load the `BlokManager` et the `RegistryManager` after load the `coverage` plugin.

## 2.9 Create the configuration file

The configuration file allow to load all the initialisation variable:

```
[AnyBlok]
key = value
```

You can extend an existing config file:



```
[AnyBlok]
extend = ``path of the configfile``
```

The logging configuration are also loaded, see [logging configuration file format](#):

```
[AnyBlok]
logging_configfile = ``name of the config file``
# json_logging_configfile = logging config file write with json
# yaml_logging_configfile = logging config file write with yaml

[loggers]
keys=root,anyblok

[handlers]
keys=consoleHandler

[formatters]
keys=consoleFormatter

[logger_root]
level=INFO
handlers=consoleHandler

[logger_anyblok]
level=INFO
handlers=consoleHandler
qualname=anyblok
propagate=1

[handler_consoleHandler]
class=StreamHandler
level=INFO
formatter=consoleFormatter
args=(sys.stdout,)

[formatter_consoleFormatter]
class=anyblok.logging.consoleFormatter
format=%(database)s: %(levelname)s - %(message)s
datefmt=
```

## 2.10 Default configuration file

You can define default *system* or *user* configuration file in fonction of your *OS*:

- **linux**
  - *system*: /etc/xdg/AnyBlok/conf.cfg
  - *user*: /home/user name/.config/AnyBlok/conf.cfg
- **mac os x**
  - *system*: /Library/Application Support/AnyBlok/conf.cfg
  - *user*: /Users/user name/Library/Application Support/AnyBlok/conf.cfg

**Note:** Works also for *windows*, See <https://pypi.python.org/pypi/appdirs>. The entry used are:

- *system*: site\_config\_dir
  - *user*: user\_config\_dir
- 

These configuration files are loaded before the specific configuration file. If the configuration file does not exist then it will not raise an error

#### Contents

- *How to add a new Type /core*
  - *Difference between Core and Type*
  - *Declare a new Type*
  - *Declare a Mixin entry type*
  - *Declare a new Core*

---

## How to add a new Type /core

---

Type and Core are both Declarations.

### 3.1 Difference between Core and Type

Core is also an Entry Type. But it is a particular entry Type. Core is used to define low level at the entry Type. For example the Core.Base is the low level at all the Model. Modify the behaviours of the Core.Base is equal to modify the behaviours of all the Model.

this is the inheritance model of the Model Type

Entry Type	inheritance Types	Core
Model	Model / Mixin	Base

### 3.2 Declare a new Type

The declaration of new Type, is declarations of a new type of declaration. The known Type declarations are:

- Model
- Mixin
- Core
- AuthorizationPolicyAssociation

This is an example to declare new entry Type:

```
from anyblok import Declarations

@Declarations.add_declaration_type()
class MyType:

    @classmethod
    def register(cls, parent, name, cls_, **kwargs):
        ...

    @classmethod
    def unregister(cls, child, cls_):
        ...
```

The Type must implement:

Method name	Description
register	This classmethod describe what append when a a declaration is done by he decorator <code>Declarations.register</code>
unregister	This classmethod describe what append when an undeclaration is done.

The `add_declaration_type` can define the arguments:

Argument's name	Description
isAnEntry	<b>Boolean</b> Define if the new Type is an entry, depend of the installation or not of the bloks
assemble	<p><b>Only for the entry “Type“</b> Waiting the name of the classmethod which make the action to group and create a new class with the complete inheritance tree:</p> <pre>@add_declaration_type(isAnEntry=True,                       assemble='assemble')</pre> <pre>class MyType:     ...      @classmethod     def assemble(cls, registry):         ...</pre> <div style="border: 1px solid black; padding: 2px; margin-top: 5px;"><b>Warning:</b> registry is the registry of the database</div>
initialize	<p><b>Only for the entry “Type“</b> Waiting the name of the classmethod which make the action to initialize the registry:</p> <pre>@add_declaration_type(isAnEntry=True,                       initialize='initialize')</pre> <pre>class MyType:     ...      @classmethod     def initialize(cls, registry):         ...</pre> <div style="border: 1px solid black; padding: 2px; margin-top: 5px;"><b>Warning:</b> registry is the registry of the database</div>

### 3.3 Declare a Mixin entry type

Mixin is a Type to add behaviours, it is not a particular Type. But it is always very interesting to use it.

AnyBlok had already a Mixin Type for the Model Type. The Mixin Type must not be the same for all the entry Type, then Model inherit only other Model or `Declarations.Mixin`. If you add an another `Declarations.AnotherMixin` then Model won't inherit this Mixin Type.

The new Mixin Type is easy to add:

```
from anyblok import Declarations
from anyblok.mixin import MixinType

@Declarations.add_declaration_type(isAnEntry=True)
```

```
class MyMixin(MixinType):
    pass
```

### 3.4 Declare a new Core

The definition of a Core and the Declaration is in different parts

Declarations of a new Core:

```
from anyblok.registry import RegistryManager

RegistryManager.declare_core('MyCore')
```

Definition or register of an overload of the Core declaration:

```
from anyblok import Declarations

@Declarations.register(Declarations.Core)
class MyCore:
    ...
```

The declaration must be done in the application, not in the blok. The is only done in the blok.

**Warning:** Core can't inherit Model, Mixin or other Type

#### Contents

- *Environmmment*
  - *Use the current environment*
    - \* *Generic use*
    - \* *Use in a Model*
  - *Define a new environment type*



---

## Environment

---

Environment stocks contextual variable. by default the environment is stocked in the current Thread.

### 4.1 Use the current environment

The environment can be used wherever in the code.

#### 4.1.1 Generic use

To get or set variable in environment, you must import the `EnvironmentManager`:

```
from anyblok.environment import EnvironmentManager
```

Set a variable:

```
EnvironmentManager.set('my variable name', OneValue)
```

Get a variable:

```
EnvironmentManager.get('my variable name', default=OneDefaultValue)
```

#### 4.1.2 Use in a Model

A facility are add in the `registry_base`. This class is inherited by all the model.

Get the environment in `Model` method or classmethod:

```
self.Env # or cls.Env
```

Set a variable:

```
self.Env.set('my variable name', OneValue)
```

Get a variable:

```
self.Env.get('my variable name', default=OneDefaultValue)
```

## 4.2 Define a new environment type

If you do not want to stock the environment in the `Thread`, you must implement a new type of environment.

This type is a simple class which have theses class methods:

- `scoped_function_for_session`
- `setter`
- `getter`

```
MyEnvironmentClass:

    @classmethod
    def scoped_function_for_session(cls):
        ...

    @classmethod
    def setter(cls, key, value):
        ...

    @classmethod
    def getter(cls, key, default):
        ...
        return value
```

Declare your class as the Environment class:

```
EnvironmentManager.define_environment_cls(MyEnvironmentClass)
```

The classmethod `scoped_function_for_session` is passed at SQLAlchemy `scoped_session` function [see](#)



## Contents

- *MEMENTO*
  - *Blok*
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  - *Model*
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    - \* *SQL Model*
    - \* *View Model*
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  - *RelationShip*
  - *Field*
  - *Mixin*
  - *SQL View*
  - *Core*
    - \* *Base*
    - \* *SqlBase*
    - \* *SqlViewBase*
    - \* *Query*
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    - \* *InstrumentedList*
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    - \* *Define a new plugin*



---

## MEMENTO

---

Anyblok mainly depends on:

- Python 3.2+
- SQLAlchemy
- Alembic

### 5.1 Blok

A blok is a collection of source code files. These files are loaded in the registry only if the blok state is `installed`.

To declare a blok you have to:

1. Declare a Python package:

The name of the module is not really significant  
--> Just create an `__init__.py` file

2. Declare a blok class in the `__init__.py` of the Python package:

```
from anyblok.blok import Blok

class MyBlok(Blok):
    """ Short description of the blok """
    ...
    version = '1.0.0'
```

Here are the available attributes for the blok:

Attribute	Description
<code>__doc__</code>	Short description of the blok (in the docstring)
<code>version</code>	the version of the blok (required because no value by default)
<code>autoinstall</code>	boolean, if <code>True</code> this blok is automatically installed
<code>priority</code>	installation order of the blok to installation
<code>readme</code>	Path of the 'readme' file of the blok, by default <code>README.rst</code>
<code>required</code>	List of the required dependancies for install
<code>optional</code>	List of the optional dependencies, their are installed if they are found
<code>conflicting</code>	List the blok which are not be installed to install this blok
<code>conditionnal</code>	If the bloks of this list ares installed the this blok will be automaticly installed

And the methods that define blok behaviours:

Method	Description
<code>import_declarations</code>	Action to do when the blok is being installed, call to import all python module which declare object from blok.
<code>reload_declarations</code>	Action to do when the blok is being installed, call to reload the import all the python module which declare object
<code>update</code>	Action to do when the blok is being install or updated. This method has one argument <code>latest_version</code> (None for install)
<code>uninstall</code>	Action to do when the blok is being uninstalled
<code>load</code>	Action to do when the server starts
<code>pre_migration</code>	Action to do when the blok is being installed or updated to make some specific migration, before auto migration. This method has one argument <code>latest_version</code> (None for install)
<code>post_migration</code>	Action to do when the blok is being installed or updated to make some specific migration, after auto migration. This method has one argument <code>latest_version</code> (None for install)

And some facility:

Method	Description
<code>import_file</code>	facility to import data

---

**Note:** The version 0.2.0 change the import and reload of the module python

---

3. Declare the entry point in the `setup.py`:

```
from setuptools import setup

setup(
    ...
    entry_points={
        'bloks': [
            'web=anyblok_web_server.bloks.web:Web',
        ],
    },
    ...
)
```

---

**Note:** The version 0.4.0, required all the declaration of the bloks on the entry point **bloks**

---

## 5.2 Declaration

In AnyBlok, everything is a declaration (Model, Mixin, ...) and you have to import the `Declarations` class:

```
from anyblok.declarations import Declarations
```

The `Declarations` has two main methods

Method name	Description
register	<p>Add the declaration in the registry This method can be used as:</p> <ul style="list-style-type: none"> <li>• A function: <pre>class Foo:     pass  register(`Declarations.type`, cls_=Foo)</pre> </li> <li>• A decorator: <pre>@register(`Declarations.type`) class Foo:     pass</pre> </li> </ul>
unregister	<p>Remove an existing declaration from the registry. This method is only used as a function:</p> <pre>from ... import Foo  unregister(`Declarations.type`, cls_=Foo)</pre>

**Note:** `Declarations.type` must be replaced by:

- Model
- ...

`Declarations.type` defines the behaviour of the `register` and `unregister` methods

## 5.3 Model

A Model is an AnyBlok class referenced in the registry. The registry is hierarchical. The model `Foo` is accessed by `registry.Foo` and the model `Foo.Bar` is accessed by `registry.Foo.Bar`.

To declare a Model you must use `register`:

```
from anyblok.declarations import Declarations

register = Declarations.register
Model = Declarations.Model

@register(Model):
class Foo:
    pass
```

The name of the model is defined by the name of the class (here `Foo`). The namespace of `Foo` is defined by the hierarchy under `Model`. In this example, `Foo` is in `Model`, you can access at `Foo` by `Model.Foo`.

**Warning:** `Model.Foo` is not the `Foo` Model. It is an avatar of `Foo` only used for the declaration.

If you define the `Bar` model, under the `Foo` model, you should write:

```
@register(Model.Foo)
class Bar:
    """ Description of the model """
    pass
```

---

**Note:** The description is used by the model `System.Model` to describe the model

---

The declaration name of Bar is `Model.Foo.Bar`. The namespace of Bar in the registry is `Foo.Bar`. The namespace of Foo in the registry is `Foo`:

```
Foo = registry.Foo
Bar = registry.Foo.Bar
```

Some models have a table in the database. The name of the table is by default the namespace in lowercase with `.` replaced with `_`.

---

**Note:** The registry is accessible only in the method of the models:

```
@register(Model)
class Foo:

    def myMethod(self):
        registry = self.registry
        Foo = registry.Foo
```

---

The main goal of AnyBlok is not only to add models in the registry, but also to easily overload these models. The declaration stores the Python class in the registry. If one model already exist then the second declaration of this model overloads the first model:

```
@register(Model)
class Foo:
    x = 1

@register(Model)
class Foo:
    x = 2

-----

Foo = registry.Foo
assert Foo.x == 2
```

Here are the parameters of the `register` method for `Model`:

Param	Description
cls_	Define the real class if <code>register</code> is used as a function not as a decorator
name_	Overload the name of the class: <pre>@register(Model, name_='Bar') class Foo:     pass</pre> <p>Declarations.Bar</p>
tablename	Overload the name of the table: <pre>@register(Model, tablename='my_table') class Foo:     pass</pre>
is_sql_view	Boolean flag, which indicate if the model is based on a SQL view
tablename	Define the real name of the table. By default the table name is the registry name without the declaration type, and with '.' replaced with '_'. This attribute is also used to map an existing table declared by a previous Model. Allowed values: <ul style="list-style-type: none"> <li>• str <pre>@register(Model, tablename='foo') class Bar:     pass</pre> </li> <li>• declaration <pre>@register(Model, tablename=Model.Foo) class Bar:     pass</pre> </li> </ul>

**Warning:** Model can only inherit simple python class, Mixin or Model.

### 5.3.1 Non SQL Model

This is the default model. This model has no tables. It is used to organize the registry or for specific process.:

```
#register(Model)
class Foo:
    pass
```

### 5.3.2 SQL Model

A SQL Model is a simple Model with Column or Relationship. For each model, one table will be created.:

```
@register(Model)
class Foo:
    # SQL Model with mapped with the table ``foo``

    id = Integer(primary_key=True)
    # id is a column on the table ``foo``
```

**Warning:** Each SQL Model have to have got one or more primary key

In the case or you need to add some configuration in the SQLAlchemy class attrinute:

- `__table_args__`
- `__mapper_args__`

you can use the next class methods

method	description
<code>define_table_args</code>	<p>Add options for SQLAlchemy table build:</p> <ul style="list-style-type: none"> <li>• Constraints on multiple columns</li> <li>• ...</li> </ul> <pre>@classmethod def define_table_args(cls, table_args, properties) # table_args: tuple of the known #           __table_args__\ # properties: properties of the assembled mode #           columns, registry name return my_tuple_value</pre>
<code>define_mapper_args</code>	<p>Add options for SQLAlchemy mappers build:</p> <ul style="list-style-type: none"> <li>• polymorphisme</li> <li>• ...</li> </ul> <pre>@classmethod def define_mapper_args(cls, mapper_args,                       properties): # table_args: dict of the known #           __mapper_args__\ # properties: properties of the assembled mode #           columns, registry name return my_dict_value</pre>

**Note:** New in 0.4.0

### 5.3.3 View Model

A View Model as SQL Model. Need the declaration of Column and / or Relationship. In the register the param `is_sql_view` must be True and the View Model must define the `sqlalchemy_view_declaration` classmethod.:

```
@register(Model, is_sql_view=True)
class Foo:

    id = Integer(primary_key=True)
    name = String()

    @classmethod
    def sqlalchemy_view_declaration(cls):
        from sqlalchemy.sql import select
        Model = cls.registry.System.Model
        return select([Model.id.label('id'), Model.name.label('name')])
```



`sqlalchemy_view_declaration` must return a select query corresponding to the request of the SQL view.

## 5.4 Column

To declare a Column in a model, add a column on the table of the model.:

```
from anyblok.declarations import Declarations
from anyblok.column import Integer, String

@Declarations.register(Declaration.Model)
class MyModel:

    id = Integer(primary_key=True)
    name = String()
```

---

**Note:** Since the version 0.4.0 the Columns are not Declarations

---

List of the column type:

- DateTime: use `datetime.datetime`, with `pytz` for the timezone
- Decimal: use `decimal.Decimal`
- Float
- Time: use `datetime.time`
- BigInteger
- Boolean
- Date: use `datetime.date`
- Integer
- Interval: use `datetime.timedelta`
- LargeBinary
- SmallInteger
- String
- Text
- uString
- uText
- Selection
- Json
- Sequence
- Color: use `colour.Color`
- Password: use `sqlalchemy_utils.types.password.Password`
- UUID: use `uuid`
- URL: use `furl.furl`

All the columns have the following optional parameters:

Parameter	Description
label	Label of the column, If None the label is the name of column capitalized
default	define a default value for this column. ..warning: The default value depends of the column type ..note: Put the name of a classmethod to call it
index	boolean flag to define whether the column is indexed
nullable	Defines if the column must be filled or not
primary_key	Boolean flag to define if the column is a primary key or not
unique	Boolean flag to define if the column value must be unique or not
foreign_key	Define a foreign key on this column to another column of another model: @register(Model) class Foo: id : Integer(primary_key=True)  @register(Model) class Bar: id : Integer(primary_key=True) foo : Integer(foreign_key=Model.Foo.use('id')) If the Model Declarations doesn't exist yet, you can use the registry name: foo : Integer(foreign_key='Model.Foo=>id'))
db_column_name	String to define the real column name in the table, different from the model attribute name
encrypt_key	Crypt the column in the database. can take the values: <ul style="list-style-type: none"> <li>• a String ex: foo = String(encrypt_key='SecretKey')</li> <li>• a classmethod name on the model</li> <li>• True value, search in the Configuration default_encrypt_key the value, they are no default. if no value exist, an exception is raised</li> </ul> ..warning: The python package cryptography must be installed

Other attribute for String and uString:

Param	Description
size	Column size in the table

Other attribute for Selection:

Param	Description
size	column size in the table
selections	dict or dict.items to give the available key with the associate label

Other attribute for Sequence:

Param	Description
size	column size in the table
code	code of the sequence
formater	formater of the sequence

Other attribute for Color:

Param	Description
size	column max size in the table

Other attribute for Password:

Param	Description
size	password max size in the table
crypt_context	see the option for the python lib <a href="#">passlib</a>

..warning:

The Password column can be found with the query meth:

Other attribute for UUID:

Param	Description
binary	Stores a UUID in the database natively when it can and falls back to a BINARY(16) or a CHAR(32)

## 5.5 Relationship

To declare a Relationship in a model, add a Relationship on the table of the model.:

```
from anyblok.declarations import Declarations
from anyblok.column import Integer
from anyblok.relationship import Many2One

@Declarations.register(Declaration.Model)
class MyModel:

    id = Integer(primary_key=True)

@Declarations.register(Declaration.Model)
class MyModel2:

    id = Integer(primary_key=True)
    mymodel = Many2One(model=Declaration.Model.MyModel)
```

**Note:** Since the version 0.4.0 the Relationship are not Declarations

List of the Relationship type:

- One2One
- Many2One
- One2Many
- Many2Many

Parameters of a `Relationship`:

Param	Description
label	The label of the column
model	The remote model
remote_column	The column name on the remote model, if no remote columns are defined the remote column will be the primary column of the remote model

Parameters of the `One2One` field:

Param	Description
column_name	Name of the local column. If the column doesn't exist then this column will be created. If no column name then the name will be 'tablename' + '_' + name of the relationships
nullable	Indicates if the column name is nullable or not
backref	Remote <code>One2One</code> link with the column name

Parameters of the `Many2One` field:

Parameter	Description
column_name	Name of the local column. If the column doesn't exist then this column will be created. If no column name then the name will be 'tablename' + '_' + name of the relationships
nullable	Indicate if the column name is nullable or not
one2many	Opposite <code>One2Many</code> link with this <code>Many2one</code>

Parameters of the `One2Many` field:

Parameter	Description
primaryjoin	Join condition between the relationship and the remote column
many2one	Opposite <code>Many2One</code> link with this <code>One2Many</code>

Parameters of the `Many2Many` field:

Parameter	Description
join_table	many2many intermediate table between both models
m2m_remote_columns	Columns name in the join table which have got the foreign key to the remote model
local_columns	Name of the local column which holds the foreign key to the join table. If the column does not exist then this column will be created. If no column name then the name will be 'tablename' + '_' + name of the relationship
m2m_local_columns	Columns name in the join table which holds the foreign key to the model
many2many	Opposite <code>Many2Many</code> link with this relationship

---

**Note:** Since 0.4.0, when the relationnal table is created by AnyBlok, the m2m\_columns become foreign keys

---

## 5.6 Field

To declare a `Field` in a model, add a `Field` on the Model, this is not a SQL column.:

```
from anyblok.declarations import Declarations
from anyblok.field import Function
from anyblok.column import Integer

@Declarations.register(Declaration.Model)
class MyModel:

    id = Integer(primary_key=True)
```

```

first_name = String()
last_name = String()
name = Function(fget='fget', fset='fset', fdel='fdel', fexpr='fexpr')

def fget(self):
    return '{0} {1}'.format(self.first_name, self.last_name)

def fset(self, value):
    self.first_name, self.last_name = value.split(' ', 1)

def fdel(self):
    self.first_name = self.last_name = None

@classmethod
def fexpr(cls):
    return func.concat(cls.first_name, ' ', cls.last_name)

```

List of the Field type:

- Function

Parameters for Field.Function

Parameter	Description
fget	name of the method to call to get the value of field: <pre>def fget(self):     return '{0} {1}'.format(self.first_name, self.last_name)</pre>
fset	name of the method to call to set the value of field: <pre>def fset(self):     self.first_name, self.last_name = value.split(</pre>
fdel	name of the method to call to del the value of field: <pre>def fdel(self):     self.first_name = self.last_name = None</pre>
fexp	name of the class method to call to filter on the field: <pre>@classmethod def fexp(self):     return func.concat(cls.first_name, ' ',                         cls.last_name)</pre>

## 5.7 Mixin

A Mixin looks like a Model, but has no tables. A Mixin adds behaviour to a Model with Python inheritance:

```

@register(Mixin)
class MyMixin:

    def foo():
        pass

@register(Model)

```

```
class MyModel(Mixin.MyMixin):
    pass

-----

assert hasattr(registry.MyModel, 'foo')
```

If you inherit a mixin, all the models previously using the base mixin also benefit from the overload:

```
@register(Mixin)
class MyMixin:
    pass

@register(Model)
class MyModel(Mixin.MyMixin):
    pass

@register(Mixin)
class MyMixin:

    def foo():
        pass

-----

assert hasattr(registry.MyModel, 'foo')
```

## 5.8 SQL View

An SQL view is a model, with the argument `is_sql_view=True` in the register. and the classmethod `sqlalchemy_view_declaration`:

```
@register(Model)
class T1:
    id = Integer(primary_key=True)
    code = String()
    val = Integer()

@register(Model)
class T2:
    id = Integer(primary_key=True)
    code = String()
    val = Integer()

@register(Model, is_sql_view=True)
class TestView:
    code = String(primary_key=True)
    val1 = Integer()
    val2 = Integer()

    @classmethod
    def sqlalchemy_view_declaration(cls):
        """ This method must return the query of the view """
        T1 = cls.registry.T1
        T2 = cls.registry.T2
        query = select([T1.code.label('code'),
```

```
T1.val.label('val1'),
T2.val.label('val2']]
return query.where(T1.code == T2.code)
```

## 5.9 Core

Core is a low level set of declarations for all the Models of AnyBlok. Core adds general behaviour to the application.

**Warning:** Core can not inherit Model, Mixin, Core, or other declaration type.

### 5.9.1 Base

Add a behaviour in all the Models, Each Model inherits Base. For instance, the `fire` method of the event come from `Core.Base`.

```
from anyblok import Declarations

@Declarations.register(Declarations.Core)
class Base:
    pass
```

### 5.9.2 SqlBase

Only the Models with `Field`, `Column`, `Relationship` inherits `Core.SqlBase`. For instance, the `insert` method only makes sense for the Model with a table.

```
from anyblok import Declarations

@Declarations.register(Declarations.Core)
class SqlBase:
    pass
```

### 5.9.3 SqlViewBase

Like `SqlBase`, only the `SqlView` inherits this Core class.

```
from anyblok import Declarations

@Declarations.register(Declarations.Core)
class SqlViewBase:
    pass
```

### 5.9.4 Query

Overloads the SQLAlchemy `Query` class.

```
from anyblok import Declarations

@Declarations.register(Declarations.Core)
class Query
    pass
```

### 5.9.5 Session

Overloads the SQLAlchemy Session class.

```
from anyblok import Declarations

@Declarations.register(Declarations.Core)
class Session
    pass
```

### 5.9.6 InstrumentedList

```
from anyblok import Declarations

@Declarations.register(Declarations.Core)
class InstrumentedList
    pass
```

InstrumentedList is the class returned by the Query for all the list result like:

- `query.all()`
- relationship list (Many2Many, One2Many)

Adds some features like getting a specific property or calling a method on all the elements of the list:

```
MyModel.query().all().foo(bar)
```

## 5.10 Sharing a table between more than one model

SQLAlchemy allows two methods to share a table between two or more mapping class:

- Inherit an SQL Model in a non-SQL Model:

```
@register(Model)
class Test:
    id = Integer(primary_key=True)
    name = String()

@register(Model)
class Test2(Model.Test):
    pass

-----

t1 = Test1.insert(name='foo')
```



```
assert Test2.query().filter(Test2.id == t1.id,
                           Test2.name == t1.name).count() == 1
```

- **Share the `__table__`.** AnyBlok cannot give the table at the declaration, because the table does not exist yet. But during the assembly, if the table exists and the model has the name of this table, AnyBlok directly links the table. To define the table you must use the named argument `tablename` in the `register`

```
@register(Model)
class Test:
    id = Integer(primary_key=True)
    name = String()

@register(Model, tablename=Model.Test)
class Test2:
    id = Integer(primary_key=True)
    name = String()

-----

t1 = Test1.insert(name='foo')
assert Test2.query().filter(Test2.id == t1.id,
                           Test2.name == t1.name).count() == 1
```

**Warning:** There are no checks on the existing columns.

## 5.11 Sharing a view between more than one model

Sharing a view between two Models is the merge between:

- Creating a View Model
- Sharing the same table between more than one model.

**Warning:** For the view you must redined the column in the Model corresponding to the view with inheritance or simple Share by `tablename`

## 5.12 Specific behaviour

AnyBlok implements some facilities to help developers

### 5.12.1 Column encryption

You can encrypt some columns to protect them. The python package cryptography must be installed:

```
pip install cryptography
```

Use the `encrypt_key` attribute on the column to define the key of cryptography:

```
@register(Model)
class MyModel:
```

```
# define the specific encrypt_key
encrypt_column_1 = String(encrypt_key='SecretKey')

# Use the default encrypt_key
encrypt_column_2 = String(encrypt_key=Configuration.get('default_encrypt_key'))
encrypt_column_3 = String(encrypt_key=True)

# Use the class method to get encrypt_key
encrypt_column_1 = String(encrypt_key='get_encrypt_key')

@classmethod
def get_encrypt_key(cls):
    return 'SecretKey'
```

The encryption works for any Columns.

### 5.12.2 Cache

The cache allows to call a method more than once without having any difference in the result. But the cache must also depend on the registry database and the model. The cache of anyblok can be put on a Model, a Core or a Mixin method. If the cache is on a Core or a Mixin then the usecase depends on the registry name of the assembled model.

Use `cache` or `classmethod_cache` to apply a cache on a method:

```
from anyblok.declarations import cache, classmethod_cache
```

**Warning:** `cache` depend of the instance, if you want add a cache for any instance you must use `classmethod_cache`

Cache the method of a Model:

```
@register(Model)
class Foo:

    @classmethod_cache()
    def bar(cls):
        import random
        return random.random()

-----

assert Foo.bar() == Foo.bar()
```

Cache the method coming from a Mixin:

```
@register(Mixin)
class MFoo:

    @classmethod_cache()
    def bar(cls):
        import random
        return random.random()

@register(Model)
class Foo(Mixin.MFoo):
    pass
```

```
@register(Model)
class Foo2(Mixin.MFoo):
    pass

-----

assert Foo.bar() == Foo.bar()
assert Foo2.bar() == Foo2.bar()
assert Foo.bar() != Foo2.bar()
```

Cache the method coming from a Mixin:

```
@register(Core)
class Base

    @classmethod_cache()
    def bar(cls):
        import random
        return random.random()

@register(Model)
class Foo:
    pass

@register(Model)
class Foo2:
    pass

-----

assert Foo.bar() == Foo.bar()
assert Foo2.bar() == Foo2.bar()
assert Foo.bar() != Foo2.bar()
```

### 5.12.3 Event

Simple implementation of a synchronous event for AnyBlok or SQLAlchemy:

```
@register(Model)
class Event:
    pass

@register(Model)
class Test:

    x = 0

    @listen(Model.Event, 'fireevent')
    def my_event(cls, a=1, b=1):
        cls.x = a * b

-----

registry.Event.fire('fireevent', a=2)
assert registry.Test.x == 2
```

---

**Note:** The decorated method is seen as a classmethod

---

This API gives:

- a decorator `listen` which binds the decorated method to the event.
- **fire method with the following parameters (Only for AnyBlok event):**
  - `event`: string name of the event
  - `*args`: positionnal arguments to pass att the decorated method
  - `**kwargs`: named argument to pass at the decorated method

It is possible to overload an existing event listener, just by overloading the decorated method:

```
@register(Model)
class Test:

    @classmethod
    def my_event(cls, **kwarg):
        res = super(Test, cls).my_event(**kwargs)
        return res * 2

-----

registry.Event.fire('fireevent', a=2)
assert registry.Test.x == 4
```

**Warning:** The overload does not take the `listen` decorator but the `classmethod` decorator, because the method name is already seen as an event listener

Some of the Attribute events of the Mapper events are implemented. See the SQLAlchemy ORM Events <http://docs.sqlalchemy.org/en/latest/orm/events.html#orm-events>

### 5.12.4 Hybrid method

Facility to create an SQLAlchemy hybrid method. See this page: <http://docs.sqlalchemy.org/en/latest/orm/extensions/hybrid.html#module-sqlalchemy.ext.hybrid>

AnyBlok allows to define a `hybrid_method` which can be overloaded, because the real sqlalchemy decorator is applied after assembling in the last overload of the decorated method:

```
from anyblok.declarations import hybrid_method

@register(Model)
class Test:

    @hybrid_method
    def my_hybrid_method(self):
        return ...
```

### 5.12.5 Pre-commit hook

It is possible to call specific classmethods just before the commit of the session:

```
@register(Model)
class Test:

    id = Integer(primary_key=True)
    val = Integer(default=0)

    @classmethod
    def method2call_just_before_the_commit(cls):
        pass

-----

registry.Test.precommit_hook('method2call_just_before_the_commit')
```

### 5.12.6 Aliased

Facility to create an SQL alias for the SQL query by the ORM:

```
select * from my_table the_table_alias.
```

This facility is given by SQLAlchemy, and anyblok adds this fonctionnality directly in the Model:

```
BlokAliased = registry.System.Blok.aliased()
```

**Note:** See this page: <http://docs.sqlalchemy.org/en/latest/orm/query.html#sqlalchemy.orm.aliased> to know the parameters of the aliased method

**Warning:** The first arg is already passed by AnyBlok

### 5.12.7 Get the registry

You can get a Model by the registry in any method of Models:

```
Model = self.registry.System.Model
assert Model.__registry_name__ == 'Model.System.Model'
```

### 5.12.8 Get the current environment

The current environment is saved in the main thread. You can add a value to the current Environment:

```
self.Env.set('My var', 'one value')
```

You can get a value from the current Environment:

```
myvalue = self.Env.get('My var', default="My default value")
```

**Note:** The environment is as a dict the value can be an instance of any type

### 5.12.9 Initialize some data by entry point

the entry point `anyblok.init` allow to define function, `init_function` in this example:

```
setup(
    ...
    entry_points={
        'anyblok.init': [
            'my_function=path:init_function',
        ],
    },
)
```

In the path the `init_function` must be defined:

```
def init_function(unittest=False):
    ...
```

..warning:

```
Use unittest parameter to defined if the function must be call
or not
```

## 5.13 Plugin

Plugin is used for the low level, it is not use in the bloks, because the model can be overload by the declaration.

### 5.13.1 Define a new plugin

A plugin can be a class or a function:

```
class MyPlugin:
    pass
```

Add the plugin definition in the configuration:

```
@Configuration.add('plugins')
def add_plugins(self, group)
    group.add_argument('--my-option', dest='plugin_name',
                      type=AnyBlokPlugin,
                      default='path:MyPlugin')
```

Use the plugin:

```
plugin = Configuration.get('plugin_name')
```

**Contents**

- *AnyBlok framework*
  - *anyblok module*
  - *anyblok.declarations module*
  - *anyblok.model module*
  - *anyblok.mapper module*
  - *anyblok.config module*
  - *anyblok.logging module*
  - *anyblok.imp module*
  - *anyblok.environment module*
  - *anyblok.blok module*
  - *anyblok.registry module*
  - *anyblok.migration module*
  - *anyblok.field module*
  - *anyblok.column module*
  - *anyblok.relationship module*
  - *anyblok.\_graphviz module*
  - *anyblok.scripts module*





---

## AnyBlok framework

---

### 6.1 anyblok module

`anyblok.start` (*processName*, *configuration\_groups=None*, *entry\_points=None*, *useseparator=False*,  
*loadwithoutmigration=False*, *config=None*, *\*\*kwargs*)  
 Function which initialize the application

```
registry = start('My application',
                 configuration_groups=['config', 'database'],
                 entry_points=['AnyBlok'])
```

#### Parameters

- **processName** – Name of the application
- **version** – Version of the application
- **prompt** – Prompt message for the help
- **configuration\_groups** – list of the group of option for argparse
- **entry\_points** – entry point where load blok
- **useseparator** – boolean, indicate if configuration option are split between two application
- **withoutautomigration** – if True, any

**Return type** registry if the database name is in the configuration

### 6.2 anyblok.declarations module

**exception** `anyblok.declarations.DeclarationsException`

Bases: `AttributeError`

Simple Exception for Declarations

**with\_traceback** ()

Exception.with\_traceback(tb) – set self.\_\_traceback\_\_ to tb and return self.

**class** `anyblok.declarations.Declarations`

Represents all the declarations done by the bloks

**Warning:** This is a global information, during the execution you must use the registry. The registry is the real assembler of the python classes based on the installed bloks

```
from anyblok import Declarations
```

**class AuthorizationBinding**

Encodes which policy to use per model or (model, permission).

In the assembly phase, copies of the policy are issued, and the registry is set as an attribute on them. This is a bit memory inefficient, but otherwise, passing the registry would have to be in all AuthorizationRule API calls.

**class Declarations.Core**

The Core class is the base of all the AnyBlok models

Add new core model:

```
@Declarations.register(Declarations.Core)
class Base:
    pass
```

Remove the core model:

```
Declarations.unregister(Declarations.Core, 'Base', Base,
                        blok='MyBlok')
```

**classmethod register** (*parent, name, cls\_, \*\*kwargs*)

Add new sub registry in the registry

**Parameters**

- **parent** – Existing declaration
- **name** – Name of the new declaration to add it
- **cls** – Class Interface to add in the declaration

**classmethod unregister** (*entry, cls\_*)

Remove the Interface from the registry

**Parameters**

- **entry** – entry declaration of the model where the `cls_` must be removed
- **cls** – Class Interface to remove in the declaration

**class Declarations.Mixin**

The Mixin class are used to define a behaviours on models:

- Add new mixin class:

```
@Declarations.register(Declarations.Mixin)
class MyMixinclass:
    pass
```

- Remove a mixin class:

```
Declarations.unregister(Declarations.Mixin.MyMixinclass, MyMixinclass)
```

**class Declarations.Model**

The Model class is used to define or inherit an SQL table.

Add new model class:

```
@Declarations.register(Declarations.Model)
class MyModelclass:
    pass
```

Remove a model class:

```
Declarations.unregister(Declarations.Model.MyModelclass,
                        MyModelclass)
```

There are three Model families:

- No SQL Model: These models have got any field, so any table
- SQL Model:
- SQL View Model: it is a model mapped with a SQL View, the insert, update delete method are forbidden by the database

Each model has a:

- registry name: compose by the parent + . + class model name
- table name: compose by the parent + '\_' + class model name

The table name can be overloaded by the attribute tablename. the wanted value are a string (name of the table) of a model in the declaration.

..warning:

```
Two models can have the same table name, both models are mapped on
the table. But they must have the same column.
```

**classmethod apply\_event\_listener** (*attr, method, registry, namespace, base, properties*)

Find the event listener methods in the base to save the namespace and the method in the registry

**Parameters**

- **attr** – name of the attribute
- **method** – method pointer
- **registry** – the current registry
- **namespace** – the namespace of the model
- **base** – One of the base of the model
- **properties** – the properties of the model

**classmethod apply\_hybrid\_method** (*base, registry, namespace, bases, transformation\_properties, properties*)

Create overload to define the write declaration of sqlalchemy hybrid method, add the overload in the declared bases of the namespace

**Parameters**

- **registry** – the current registry
- **namespace** – the namespace of the model
- **base** – One of the base of the model
- **transformation\_properties** – the properties of the model
- **properties** – assembled attributes of the namespace

**classmethod apply\_sqlalchemy\_event\_listener** (*attr, method, registry, namespace, base, properties*)

declare in the registry the sqlalchemy event

**Parameters**

- **attr** – name of the attribute
- **method** – method pointer
- **registry** – the current registry
- **namespace** – the namespace of the model

- **base** – One of the base of the model
- **properties** – the properties of the model

**classmethod `apply_table_and_mapper_args`** (*base, registry, namespace, bases, transformation\_properties, properties*)

Create overwrite to define table and mapper args to define some options for SQLAlchemy

**Parameters**

- **registry** – the current registry
- **namespace** – the namespace of the model
- **base** – One of the base of the model
- **transformation\_properties** – the properties of the model
- **properties** – assembled attributes of the namespace

**classmethod `apply_view`** (*namespace, tablename, base, registry, properties*)

Transform the sqlalchemy model to view model

**Parameters**

- **namespace** – Namespace of the model
- **tablename** – Name of the table of the model
- **base** – Model cls
- **registry** – current registry
- **properties** – properties of the model

**Exception** MigrationException

**Exception** ViewException

**classmethod `assemble_callback`** (*registry*)

Assemble callback is called to assemble all the Model from the installed bloks

**Parameters** **registry** – registry to update

**classmethod `declare_field`** (*registry, name, field, namespace, properties*)

Declare the field/column/relationship to put in the properties of the model

**Parameters**

- **registry** – the current registry
- **name** – name of the field / column or relationship
- **field** – the declaration field / column or relationship
- **namespace** – the namespace of the model
- **properties** – the properties of the model

**classmethod `detect_hybrid_method`** (*attr, method, registry, namespace, base, properties*)

Find the sqlalchemy hybrid methods in the base to save the namespace and the method in the registry

**Parameters**

- **attr** – name of the attribute
- **method** – method pointer
- **registry** – the current registry
- **namespace** – the namespace of the model
- **base** – One of the base of the model
- **properties** – the properties of the model

**classmethod `detect_table_and_mapper_args`** (*registry, namespace, base, properties*)

Test if define\_table/mapper\_args are in the base, and call them save the value in the properties

if \_\_table/mapper\_args\_\_ are in the base then raise ModelException

**Parameters**

- **registry** – the current registry
- **namespace** – the namespace of the model
- **base** – One of the base of the model
- **properties** – the properties of the model

**Exception** ModelException

**classmethod `initialize_callback`** (*registry*)

initialize callback is called after assembling all entries

This callback updates the database information about

- Model
- Column
- RelationShip

**Parameters** **registry** – registry to update

**classmethod `insert_in_bases`** (*registry, namespace, bases, transformation\_properties, properties*)

Add in the declared namespaces new base.

**Parameters**

- **registry** – the current registry
- **namespace** – the namespace of the model
- **base** – One of the base of the model
- **transformation\_properties** – the properties of the model
- **properties** – assembled attributes of the namespace

**classmethod `load_namespace_first_step`** (*registry, namespace*)

Return the properties of the declared bases for a namespace. This is the first step because some actions need to know all the properties

**Parameters**

- **registry** – the current registry
- **namespace** – the namespace of the model

**Return type** dict of the known properties

**classmethod `load_namespace_second_step`** (*registry, namespace, realregistryname=None, transformation\_properties=None*)

Return the bases and the properties of the namespace

**Parameters**

- **registry** – the current registry
- **namespace** – the namespace of the model
- **realregistryname** – the name of the model if the namespace is a mixin

**Return type** the list of the bases and the properties

**Exception** `ModelException`

**classmethod `register`** (*parent, name, cls\_, \*\*kwargs*)

add new sub registry in the registry

**Parameters**

- **parent** – Existing global registry
- **name** – Name of the new registry to add it
- **cls** – Class Interface to add in registry

**classmethod `transform_base`** (*registry, namespace, base, properties*)

Detect specific declaration which must define by registry

**Parameters**

- **registry** – the current registry
- **namespace** – the namespace of the model
- **base** – One of the base of the model
- **properties** – the properties of the model

**Return type** new base

**classmethod `unregister`** (*entry, cls\_*)

Remove the Interface from the registry

**Parameters**

- **entry** – entry declaration of the model where the `cls_` must be removed

- **cls** – Class Interface to remove in registry

**classmethod** `Declarations.add_declaration_type` (*cls=None, isAnEntry=False, as-semble=None, initialize=None, unload=None*)

Add a declaration type

**Parameters**

- **cls** – The `class` object to add as a world of the `MetaData`
- **isAnEntry** – if true the type will be assembled by the registry
- **assemble** – name of the method callback to call (classmethod)
- **initialize** – name of the method callback to call (classmethod)
- **unload** – name of the method callback to call (classmethod)

**Exception** `DeclarationsException`

**classmethod** `Declarations.register` (*parent, cls=None, \*\*kwargs*)

Method to add the blok in the registry under a type of declaration

**Parameters**

- **parent** – An existing blok class in the Declaration
- **cls\_** – The `class` object to add in the Declaration

**Return type** `cls_`

**Exception** `DeclarationsException`

**classmethod** `Declarations.unregister` (*entry, cls\_*)

Method to remove the blok from a type of declaration

**Parameters**

- **entry** – declaration entry of the model where the `cls_` must be removed
- **cls\_** – The `class` object to remove from the Declaration

**Return type** `cls_`

## 6.3 anyblok.model module

**exception** `anyblok.model.ModelException`

Bases: `Exception`

Exception for Model declaration

**with\_traceback** ()

Exception.with\_traceback(tb) – set self.\_\_traceback\_\_ to tb and return self.

**exception** `anyblok.model.ViewException`

Bases: `anyblok.model.ModelException`

Exception for View declaration

**with\_traceback** ()

Exception.with\_traceback(tb) – set self.\_\_traceback\_\_ to tb and return self.

## 6.4 anyblok.mapper module

**exception** `anyblok.mapper.ModelAttributeException`

Bases: `Exception`

Exception for Model attribute

**with\_traceback** ()

Exception.with\_traceback(tb) – set self.\_\_traceback\_\_ to tb and return self.

**exception** `anyblok.mapper.ModelReprException`

Bases: `Exception`

Exception for Model attribute

**with\_traceback** ()

Exception.with\_traceback(tb) – set self.\_\_traceback\_\_ to tb and return self.

**exception** `anyblok.mapper.ModelAttributeAdapterException`

Bases: `Exception`

Exception for Model attribute adapter

**with\_traceback** ()

Exception.with\_traceback(tb) – set self.\_\_traceback\_\_ to tb and return self.

**exception** `anyblok.mapper.MapperException`

Bases: `AttributeError`

Simple Exception for Mapper

**with\_traceback** ()

Exception.with\_traceback(tb) – set self.\_\_traceback\_\_ to tb and return self.

**class** `anyblok.mapper.ModelRepr(model_name)`

Pseudo class to represent a model

```
mr = ModelRepr('registry name')
```

**check\_model** (*registry*)

Check if the model exist else raise an exception

**Parameters** **registry** – instance of the registry

**Return type** dict which represent the first step of the model

**Exceptions** `ModelReprException`

**foreign\_keys\_for** (*registry, remote\_model*)

Return the of the primary keys

**Parameters** **registry** – instance of the registry

**Return type** list of `ModelAttribute`

**primary\_keys** (*registry*)

Return the of the primary keys

**Parameters** **registry** – instance of the registry

**Return type** list of `ModelAttribute`

**tablename** (*registry*)

Return the real tablename of the Model

**Parameters** **registry** – instance of the registry

**Return type** string

**class** `anyblok.mapper.ModelAttribute(model_name, attribute_name)`

The Model attribute represents the using of a declared attribute, in the goal of get the real attribute after of the foreign\_key:

```
ma = ModelAttribute('registry name', 'attribute name')
```

**get\_attribute** (*registry*, *usehybrid=True*)

Return the assembled attribute, the model need to be assembled

**Parameters**

- **registry** – instance of the registry
- **usehybrid** – if True return the hybrid property if exist

**Return type** instance of the attribute

**Exceptions** ModelAttributeException

**get\_column\_name** (*registry*)

Return the name of the column

the need of foreign key may be before the creation of the model in the registry, so we must use the first step of assembling

**Parameters** **registry** – instance of the registry

**Return type** str of the foreign key (tablename.columnname)

**Exceptions** ModelAttributeException

**get\_fk** (*registry*)

Return the foreign key which represent the attribute in the data base

**Parameters** **registry** – instance of the sqlalchemy ForeignKey

**Return type** instance of the attribute

**get\_fk\_column** (*registry*)

Return the foreign key which represent the attribute in the data base

**Parameters** **registry** – instance of the sqlalchemy ForeignKey

**Return type** instance of the attribute

**get\_fk\_mapper** (*registry*)

Return the foreign key which represent the attribute in the data base

**Parameters** **registry** – instance of the sqlalchemy ForeignKey

**Return type** instance of the attribute

**get\_fk\_name** (*registry*)

Return the name of the foreign key

the need of foreign key may be before the creation of the model in the registry, so we must use the first step of assembling

**Parameters** **registry** – instance of the registry

**Return type** str of the foreign key (tablename.columnname)

**Exceptions** ModelAttributeException



**options** (\*\*kwargs)

Add foreign key options to create the sqlalchemy ForeignKey

**Parameters** \*\*kwargs – options

**Return type** the instance of the ModelAttribute

**class** anyblok.mapper.**ModelMapper** (mapper, event, \*args, \*\*kwargs)

**class** anyblok.mapper.**ModelAttributeMapper** (mapper, event, \*args, \*\*kwargs)

anyblok.mapper.**ModelAttributeAdapter** (Model)

Return a ModelAttribute

**Parameters** **Model** – ModelAttribute or string ('registry name'=>'attribute name')

**Return type** instance of ModelAttribute

**Exceptions** ModelAttributeAdapterException

anyblok.mapper.**ModelAdapter** (Model)

Return a ModelRepr

**Parameters** **Model** – ModelRepr or string

**Return type** instance of ModelRepr

**Exceptions** ModelAdapterException

anyblok.mapper.**MapperAdapter** (mapper, \*args, \*\*kwargs)

## 6.5 anyblok.config module

**exception** anyblok.config.**ConfigurationException**

Bases: LookupError

Simple Exception for Configuration

**with\_traceback** ()

Exception.with\_traceback(tb) – set self.\_\_traceback\_\_ to tb and return self.

**class** anyblok.config.**Configuration**

Configuration is used to define the options of the real argparse and its default values. Each application or blok can declare needed options here.

This class stores three attributes:

- groups: lists of options indexed by part, a part is a ConfigParser group, or a process name
- labels: if a group has got a label then all the options in group are gathered in a parser group
- configuration: result of the Configuration after loading

**classmethod** **add** (group, part='bloks', label=None, function\_=None, must\_be\_loaded\_by\_unittest=False)

Add a function in a part and a group.

The function must have two arguments:

- parser: the parser instance of argparse
- default: A dict with the default value

This function is called to know what the options of this must do. You can declare this group:

- either by calling the `add` method as a function:

```
def foo(parser, default):  
    pass  
  
Configuration.add('create-db', function_=foo)
```

- or by calling the `add` method as a decorator:

```
@Configuration.add('create-db')  
def bar(parser, default):  
    pass
```

By default the group is unnamed, if you want a named group, you must set the `label` attribute:

```
@Configuration.add('create-db', label="Name of the group")  
def bar(parser, default):  
    pass
```

#### Parameters

- **part** – ConfigParser group or process name
- **group** – group is a set of parser option
- **label** – If the group has a label then all the functions in the group are put in group parser
- **function** – function to add
- **must\_be\_loaded\_by\_unittest** – unittest call this function to init configuration of AnyBlok for run unittest”

**classmethod** `get` (*opt*, *default=None*)

Get a value from the configuration dict after loading

After the loading of the application, all the options are saved in the Configuration. And all the applications have free access to these options:

```
from anyblok._configuration import Configuration  
  
database = Configuration.get('db_name')
```

..warning:

```
Some options are used as a default value not real value, such  
as the db_name
```

#### Parameters

- **opt** – name of the option
- **default** – default value if the option doesn't exist

**classmethod** `has` (*option*)

Check if the option exist in the configuration dict

Return True if the option is in the configuration dict and the value is not None. A None value is different than a ConfigOption with None value

**Parameters** **opt** – option key to check

**Return type** boolean True is exist

**classmethod load** (*application, configuration\_groups=None, parts\_to\_load=('bloks', ), useseparator=False, \*\*kwargs*)

Load the argparse definition and parse them

#### Parameters

- **application** – name of the application
- **configuration\_groups** – iterable configuration group to load
- **parts\_to\_load** – group of blok to load
- **useseparator** – boolean(default False)
- **\*\*kwargs** – ArgumentParser named arguments

**classmethod load\_config\_for\_test** ()

Load the argparse configuration need for the unittest

**classmethod remove** (*group,function\_, part='bloks'*)

Remove an existing function

If your application inherits some unwanted options from a specific function, you can unlink this function:

```
def foo(opt, default):
    pass

Configuration.add('create-db', function_=foo)
Configuration.remove('create-db', function_=foo)
```

#### Parameters

- **part** – ConfigParser group or process name
- **group** – group is a set of parser option
- **function** – function to add

**classmethod remove\_label** (*group, part='bloks'*)

Remove an existing label

The goal of this function is to remove an existing label of a specific group:

```
@Configuration.add('create-db', label="Name of the group")
def bar(parser, default):
    pass

Configuration.remove_label('create-db')
```

#### Parameters

- **part** – ConfigParser group or process name
- **group** – group is a set of parser option

**classmethod set** (*opt, value*)

Set a value to the configuration dict

#### Parameters

- **opt** – name of the option
- **value** – value to set

## 6.6 anyblok.logging module

**class** anyblok.logging.**consoleFormatter** (*fmt=None, datefmt=None, style='%'*)

Bases: logging.Formatter

Define the format for console logging

**converter** ()

**localtime**([seconds]) -> (tm\_year,tm\_mon,tm\_mday,tm\_hour,tm\_min,  
tm\_sec,tm\_wday,tm\_yday,tm\_isdst)

Convert seconds since the Epoch to a time tuple expressing local time. When 'seconds' is not passed in, convert the current time instead.

**format** (record)

Add color to the message

**Parameters** **record** – logging record instance

**Return type** logging record formatted

**formatException** (ei)

Format and return the specified exception information as a string.

This default implementation just uses traceback.print\_exception()

**formatStack** (stack\_info)

This method is provided as an extension point for specialized formatting of stack information.

The input data is a string as returned from a call to traceback.print\_stack(), but with the last trailing newline removed.

The base implementation just returns the value passed in.

**formatTime** (record, datefmt=None)

Return the creation time of the specified LogRecord as formatted text.

This method should be called from format() by a formatter which wants to make use of a formatted time. This method can be overridden in formatters to provide for any specific requirement, but the basic behaviour is as follows: if datefmt (a string) is specified, it is used with time.strftime() to format the creation time of the record. Otherwise, the ISO8601 format is used. The resulting string is returned. This function uses a user-configurable function to convert the creation time to a tuple. By default, time.localtime() is used; to change this for a particular formatter instance, set the 'converter' attribute to a function with the same signature as time.localtime() or time.gmtime(). To change it for all formatters, for example if you want all logging times to be shown in GMT, set the 'converter' attribute in the Formatter class.

**usesTime** ()

Check if the format uses the creation time of the record.

**class** anyblok.logging.**anyblokFormatter** (*fmt=None, datefmt=None, style='%'*)

Bases: logging.Formatter

Define the format for console logging

**converter** ()

**localtime**([seconds]) -> (tm\_year,tm\_mon,tm\_mday,tm\_hour,tm\_min,  
tm\_sec,tm\_wday,tm\_yday,tm\_isdst)

Convert seconds since the Epoch to a time tuple expressing local time. When 'seconds' is not passed in, convert the current time instead.

**format** (*record*)

Add color to the message

**Parameters** **record** – logging record instance

**Return type** logging record formatted

**formatException** (*ei*)

Format and return the specified exception information as a string.

This default implementation just uses `traceback.print_exception()`

**formatStack** (*stack\_info*)

This method is provided as an extension point for specialized formatting of stack information.

The input data is a string as returned from a call to `traceback.print_stack()`, but with the last trailing newline removed.

The base implementation just returns the value passed in.

**formatTime** (*record, datefmt=None*)

Return the creation time of the specified LogRecord as formatted text.

This method should be called from `format()` by a formatter which wants to make use of a formatted time. This method can be overridden in formatters to provide for any specific requirement, but the basic behaviour is as follows: if `datefmt` (a string) is specified, it is used with `time.strftime()` to format the creation time of the record. Otherwise, the ISO8601 format is used. The resulting string is returned. This function uses a user-configurable function to convert the creation time to a tuple. By default, `time.localtime()` is used; to change this for a particular formatter instance, set the ‘converter’ attribute to a function with the same signature as `time.localtime()` or `time.gmtime()`. To change it for all formatters, for example if you want all logging times to be shown in GMT, set the ‘converter’ attribute in the `Formatter` class.

**usesTime** ()

Check if the format uses the creation time of the record.

`anyblok.logging.log` (*logger, level='info', withargs=False*)

decorator to log the entry of a method

There are 5 levels of logging \* debug \* info (default) \* warning \* error \* critical

example:

```
from logging import getLogger
logger = getLogger(__name__)

@log(logger)
def foo(...):
    ...
```

#### Parameters

- **level** – AnyBlok log level
- **withargs** – If True, add args and kwargs in the log message

## 6.7 anyblok.imp module

**exception** `anyblok.imp.ImportManagerException`

Bases: `AttributeError`

Exception for Import Manager

**with\_traceback()**

Exception.with\_traceback(tb) – set self.\_\_traceback\_\_ to tb and return self.

**class** anyblok.imp.**ImportManager**

Use to import the blok or reload the blok imports

Add a blok and imports its modules:

```
blok = ImportManager.add('my blok')
blok.imports()
```

Reload the modules of a blok:

```
if ImportManager.has('my blok'):
    blok = ImportManager.get('my blok')
    blok.reload()
    # import the unimported module
```

**classmethod** **add**(blok)

Store the blok so that we know which bloks to reload if needed

**Parameters** **blok** – name of the blok to add

**Return type** loader instance

**Exception** ImportManagerException

**classmethod** **get**(blok)

Return the module imported for this blok

**Parameters** **blok** – name of the blok to add

**Return type** loader instance

**Exception** ImportManagerException

**classmethod** **has**(blok)

Return True if the blok was imported

**Parameters** **blok** – name of the blok to add

**Return type** boolean

## 6.8 anyblok.environment module

**exception** anyblok.environment.**EnvironmentException**

Bases: AttributeError

Exception for the Environment

**with\_traceback()**

Exception.with\_traceback(tb) – set self.\_\_traceback\_\_ to tb and return self.

**class** anyblok.environment.**EnvironmentManager**

Manage the Environment for an application

**classmethod** **define\_environment\_cls**(Environment)

Define the class used for the environment

**Parameters** **Environment** – class of environment

**Exception** EnvironmentException

**environment**

alias of ThreadEnvironment

**classmethod get** (*key*, *default=None*)

Load the value of the key in the environment

**Parameters**

- **key** – the key of the value to load
- **default** – return this value if not value loaded for the key

**Return type** the value of the key**Exception** EnvironmentException**classmethod scoped\_function\_for\_session** ()

Save the value of the key in the environment

**classmethod set** (*key*, *value*)

Save the value of the key in the environment

**Parameters**

- **key** – the key of the value to save
- **value** – the value to save

**Exception** EnvironmentException**class** anyblok.environment.**ThreadEnvironment**

Use the thread, to get the environment

**classmethod getter** (*key*, *default*)

Get the value of the key in the environment

**Parameters**

- **key** – the key of the value to retrieve
- **default** – return this value if no value loaded for the key

**Return type** the value of the key**scoped\_function\_for\_session = None**

No scoped function here because for none value sqlalchemy already uses a thread to save the session

**classmethod setter** (*key*, *value*)

Save the value of the key in the environment

**Parameters**

- **key** – the key of the value to save
- **value** – the value to save

## 6.9 anyblok.blok module

**exception** anyblok.blok.**BlokManagerException** (*\*args*, *\*\*kwargs*)

Bases: LookupError

Simple exception to BlokManager

**with\_traceback** ()

Exception.with\_traceback(tb) – set self.\_\_traceback\_\_ to tb and return self.

**class** `anyblok.blok.BlokManager`

Manage the bloks for one process

A blok has a *setuptools* entrypoint, this entry point is defined by the `entry_points` attribute in the first load

The `bloks` attribute is a dict with all the loaded entry points

Use this class to import all the bloks in the entrypoint:

`BlokManager.load()`

**classmethod** `add_importer` (*key*, *cls\_name*)

Add a new importer

**Parameters**

- **key** – key of the importer
- **cls\_name** – name of the model to import

**classmethod** `get` (*blok*)

Return the loaded blok

**Parameters** **blok** – blok name

**Return type** blok instance

**Exception** `BlokManagerException`

**classmethod** `getPath` (*blok*)

Return the path of the blok

**Parameters** **blok** – blok name in `ordered_bloks`

**Return type** absolute path

**classmethod** `get_importer` (*key*)

Get the importer class name

**Parameters** **key** – key of the importer

**Return type** name of the model to import

**Exception** `BlokManagerException`

**classmethod** `has` (*blok*)

Return True if the blok is loaded

**Parameters** **blok** – blok name

**Return type** bool

**classmethod** `has_importer` (*key*)

Check if an importer

**classmethod** `list` ()

Return the ordered bloks

**Return type** list of blok name ordered by loading

**classmethod** `load` (*entry\_points*=('bloks', ))

Load all the bloks and import them

**Parameters** **entry\_points** – Use by `iter_entry_points` to get the blok

**Exception** `BlokManagerException`



**classmethod reload()**

Reload the entry points

Empty the `bloks` dict and use the `entry_points` attribute to load bloks :exception: `BlokManagerException`

**classmethod set** (*blokname, blok*)

Add a new blok

**Parameters**

- **blokname** – blok name
- **blok** – blok instance

**Exception** `BlokManagerException`

**classmethod unload()**

Unload all the bloks but not the registry

**class** `anyblok.blok.Blok` (*registry*)

Super class for all the bloks

define the default value for:

- **priority**: order to load the blok
- **required**: list of the bloks needed to install this blok
- **optional**: list of the bloks to be installed if present in the blok list
- **conditional**: if all the bloks of this list are installed then install this blok

**classmethod import\_declaration\_module()**

Do the python import for the Declaration of the model or other

**import\_file** (*importer\_name, model, \*file\_path, \*\*kwargs*)

Import data file

**Parameters**

- **importer\_name** – Name of the importer (need installation of the Blok which have the importer)
- **model** – Model of the data to import
- **\*file\_path** – relative path of the path in this Blok
- **\*\*kwargs** – Option for the importer

**Return type** return dict of result

**load()**

Call at the launch of the application

**post\_migration** (*latest\_version*)

Call at update, after the automigration

**Parameters** **latest\_version** – latest version installed, if the blok have not been installing the latest\_version will be None

**pre\_migration** (*latest\_version*)

Call at update, before the automigration

**Warning:** You can not use the ORM

**Parameters** `latest_version` – latest version installed, if the blok have not been installing the `latest_version` will be `None`

**uninstall()**

Call at the uninstallation

**update** (*latest\_version*)

Call at the installation or update

**Parameters** `latest_version` – latest version installed, if the blok have not been installing the `latest_version` will be `None`

## 6.10 anyblok.registry module

**exception** `anyblok.registry.RegistryManagerException`

Bases: `Exception`

Simple Exception for Registry

**with\_traceback()**

`Exception.with_traceback(tb)` – set `self.__traceback__` to `tb` and return `self`.

**exception** `anyblok.registry.RegistryException`

Bases: `Exception`

Simple Exception for Registry

**with\_traceback()**

`Exception.with_traceback(tb)` – set `self.__traceback__` to `tb` and return `self`.

**class** `anyblok.registry.RegistryManager`

Manage the global registry

Add new entry:

```
RegistryManager.declare_entry('newEntry')
RegistryManager.init_blok('newBlok')
EnvironmentManager.set('current_blok', 'newBlok')
RegistryManager.add_entry_in_register(
    'newEntry', 'oneKey', cls_)
EnvironmentManager.set('current_blok', None)
```

Remove an existing entry:

```
if RegistryManager.has_entry_in_register('newBlok', 'newEntry',
                                         'oneKey'):
    RegistryManager.remove_entry_in_register(
        'newBlok', 'newEntry', 'oneKey', cls_)
```

get a new registry for a database:

```
registry = RegistryManager.get('my database')
```

**classmethod** `add_core_in_register` (*core*, *cls\_*)

Load core in blok

warning the global var `current_blok` must be filled on the good blok

**Parameters**

- **core** – is the existing core name

- **cls\_** – Class of the Core to save in loaded blok target registry

**classmethod add\_entry\_in\_register** (*entry, key, cls\_, \*\*kwargs*)

Load entry in blok

warning the global var `current_blok` must be filled on the good blok :param `entry`: is the existing entry name :param `key`: is the existing key in the entry :param `cls_`: Class of the entry / key to remove in loaded blok

**classmethod add\_or\_replace\_blok\_property** (*property\_, value*)

Save the value in the properties

#### Parameters

- **property\_** – name of the property
- **value** – the value to save, the type is not important

**classmethod clear** ()

Clear the registry dict to force the creation of new registry

**classmethod declare\_core** (*core*)

Add new core in the declared cores

```
RegistryManager.declare_core('Core name')

-----

@Declarations.register(Declarations.Core)
class ``Core name``:
    ...
```

**Warning:** The core must be declared in the application, not in the bloks The declaration must be done before the loading of the bloks

**Parameters core** – core name

**classmethod declare\_entry** (*entry, assemble\_callback=None, initialize\_callback=None*)

Add new entry in the declared entries

```
def assemble_callback(registry):
    ...

def initialize_callback(registry):
    ...

RegistryManager.declare_entry(
    'Entry name', assemble_callback=assemble_callback,
    initialize_callback=initialize_callback)

@Declarations.register(Declarations.``Entry name``)
class MyClass:
    ...
```

**Warning:** The entry must be declared in the application, not in the bloks The declaration must be done before the loading of the bloks

#### Parameters

- **entry** – entry name
- **assemble\_callback** – function callback to call to assemble

- **initialize\_callback** – function callback to call to init after assembling

**classmethod declare\_unload\_callback** (*entry, unload\_callback*)

Save a unload callback in registry Manager

**Parameters**

- **entry** – declaration type name
- **unload\_callback** – classmethod pointer

**classmethod get** (*db\_name, loadwithoutmigration=False, \*\*kwargs*)

Return an existing Registry

If the Registry doesn't exist then the Registry are created and added to registries dict

**Parameters** **db\_name** – the name of the database linked to this registry

**Return type** Registry

**classmethod get\_blok\_property** (*property\_, default=None*)

Return the value in the properties

**Parameters**

- **property\_** – name of the property
- **default** – return default If not entry in the property

**classmethod has\_blok** (*blok*)

Return True if the blok is already loaded

**Parameters** **blok** – name of the blok

**Return type** boolean

**classmethod has\_blok\_property** (*property\_*)

Return True if the property exists in blok

**Parameters** **property\_** – name of the property

**classmethod has\_core\_in\_register** (*blok, core*)

Return True if One Class exist in this blok for this core

**Parameters**

- **blok** – name of the blok
- **core** – is the existing core name

**classmethod has\_entry\_in\_register** (*blok, entry, key*)

Return True if One Class exist in this blok for this entry

**Parameters**

- **blok** – name of the blok
- **entry** – is the existing entry name
- **key** – is the existing key in the entry

**classmethod init\_blok** (*blokname*)

init one blok to be known by the RegistryManager

All bloks loaded must be initialized because the registry will be created with this information

**Parameters** **blokname** – name of the blok

**classmethod reload()**

Reload the blok

The purpose is to reload the python module to get changes in python file

**classmethod remove\_blok\_property** (*property\_*)

Remove the property if exist

**Parameters** *property\_* – name of the property

**classmethod remove\_in\_register** (*cls\_*)

Remove Class in blok and in entry

**Parameters** *cls\_* – Class of the entry / key to remove in loaded blok

**classmethod unload()**

Call all the unload callbacks

**class** anyblok.registry.**Registry** (*db\_name*, *loadwithoutmigration=False*, *unittest=False*, *\*\*kwargs*)

Define one registry

A registry is linked to a database, and stores the definition of the installed Bloks, Models, Mixins for this database:

```
registry = Registry('My database')
```

**add\_in\_registry** (*namespace*, *base*)

Add a class as an attribute of the registry

**Parameters**

- **namespace** – tree path of the attribute
- **base** – class to add

**apply\_state** (*blok\_name*, *state*, *in\_states*)

Apply the state of the blok name

**Parameters**

- **blok\_name** – the name of the blok
- **state** – the state to apply
- **in\_states** – the blok must be in this state

**Exception** RegistryException

**check\_permission** (*target*, *principals*, *permission*)

Check that one of the principals has permission on target.

**Parameters**

- **target** – model instance (record) or class. Checking a permission on a model class with a policy that needs to work on records is considered a configuration error: the policy has the right to fail.
- **principals** – list, set or tuple of strings

**Return type** bool

**clean\_model** ()

Clean the registry of all the namespaces

**close** ()

Release the session, connection and engine

**close\_session()**

Close only the session, not the registry After the call of this method the registry won't be usable you should use close method which call this method

**commit(\*args, \*\*kwargs)**

Overload the commit method of the SQLAlchemy session

**complete\_reload()**

Reload the code and registry

**create\_session\_factory()**

Create the SQLA Session factory

in function of the Core Session class and the Core Query class

**engine**

property to get the engine

**expire(obj, attribute\_names=None)**

Expire object in session, you can define some attribute which are expired:

```
registry.expire(instance, ['attr1', 'attr2', ...])
```

#### Parameters

- **obj** – instance of Model
- **attribute\_names** – list of string, names of the attr to expire

**get(namespace)**

Return the namespace Class

**Parameters namespace** – namespace to get from the registry str

**Return type** namespace cls

**Exception** RegistryManagerException

**get\_bloks\_by\_states(\*states)**

Return the bloks in these states

**Parameters states** – list of the states

**Return type** list of blok's name

**get\_bloks\_to\_install(loader)**

Return the bloks to install in the registry

**Return type** list of blok's name

**get\_bloks\_to\_load()**

Return the bloks to load by the registry

**Return type** list of blok's name

**ini\_var()**

Initialize the var to load the registry

**init\_bind()**

Initialize the bind

**init\_engine(db\_name=None)**

Define the engine

**Parameters db\_name** – name of the database to link

**init\_engine\_options** ()

Define the options to initialize the engine

**load** ()

Load all the namespaces of the registry

Create all the table, make the shema migration Update Blok, Model, Column rows

**load\_blok** (*blok*, *toinstall*, *toload*)

load on blok, load all the core and all the entry for one blok

**Parameters** **blok** – name of the blok

**Exception** RegistryManagerException

**load\_core** (*blok*, *core*)

load one core type for one blok

**Parameters**

- **blok** – name of the blok
- **core** – the core name to load

**load\_entry** (*blok*, *entry*)

load one entry type for one blok

**Parameters**

- **blok** – name of the blok
- **entry** – declaration type to load

**lookup\_policy** (*target*, *permission*)

Return the policy instance that applies to target or its model.

**Parameters** **target** – model class or instance

If a policy is declared for the precise permission, it is returned. Otherwise, the default policy for that model is returned. By ultimate default the special `anyblok.authorization.rule.DenyAll` is returned.

**must\_recreate\_session\_factory** ()

Check if the SQLA Session Factory must be destroy and recreate

**Return type** Boolean, True if nb Core Session/Query inheritance change

**precommit\_hook** (*registryname*, *method*, *\*args*, *\*\*kwargs*)

Add a method in the precommit\_hook list

a precommit hook is a method called just after the commit, it is used to call this method once, because a hook is saved only once

**Parameters**

- **registryname** – namespace of the model
- **method** – method to call on the registryname
- **put\_at\_the\_end\_if\_exist** – if true and hook already exist then the hook are moved at the end

**refresh** (*obj*, *attribute\_names=None*)

Expire and reload object in session, you can define some attribute which are refreshed:

```
registry.refresh(instance, ['attr1', 'attr2', ...])
```

**Parameters**

- **obj** – instance of `Model`
- **attribute\_names** – list of string, names of the attr to refresh

**reload()**

Reload the registry, close session, clean registry, reinit var

**upgrade** (*install=None, update=None, uninstall=None*)

Upgrade the current registry

**Parameters**

- **install** – list of the blok to install
- **update** – list of the blok to update
- **uninstall** – list of the blok to uninstall

**Exception** `RegistryException`**wrap\_query\_permission** (*query, principals, permission, models=()*)

Wrap query to return only authorized results

**Parameters**

- **principals** – list, set or tuple of strings
- **models** – models on which to apply security filtering. If not supplied, it will be inferred from the query. The length and ordering much match that of expected results.

**Returns** a query-like object, implementing the results fetching API, but that can't be further filtered.

This method calls all the relevant policies to apply pre- and post-filtering. Although postfiltering is discouraged in authorization policies for performance and expressiveness (limit, offset), there are cases for which it is unavoidable, or in which the tradeoff goes the other way.

In normal operation, the relevant models are inferred directly from the query. For join situations, and more complex queries, the caller has control on the models on which to exert permission checking.

For instance, it might make sense to use a join between `Model1` and `Model2` to actually constrain `Model1` (on which permission filtering should occur) by information contained in `Model2`, even if the passed principals should not grant access to the relevant `Model2` records.

## 6.11 anyblok.migration module

**Warning:** AnyBlok use Alembic to do the dynamic migration, but Alembic does'nt detect all the change (primary key, ...), we must wait the Alembic or implement it in Alembic project before use it in AnyBlok

**exception** `anyblok.migration.MigrationException`Bases: `AttributeError`

Simple Exception class for Migration

**with\_traceback** ()

Exception.with\_traceback(tb) – set self.\_\_traceback\_\_ to tb and return self.



**class** anyblok.migration.**MigrationReport** (*migration, diffs*)

Change report

Get a new report:

```
report = MigrationReport(migrationinstance, change_detected)
```

**apply\_change** ()

Apply the migration

this method parses the detected change and calls the Migration system to apply the change with the api of Declarations

**log\_has** (*log*)

return True id the log is present

**Warning:** this method is only used for the unittest

**Parameters** **log** – log sentence expected

**class** anyblok.migration.**MigrationConstraintForeignKey** (*table, name*)

Used to apply a migration on a foreign key

You can add:

```
table.column('my column').foreign_key().add(Blok.name)
```

Or drop:

```
table.column('my column').foreign_key().drop()
```

**add** (*local\_columns, remote\_columns, \*\*kwargs*)

Add a new foreign key

**Parameters** **remote\_field** – The column of the remote model

**Return type** MigrationConstraintForeignKey instance

**drop** ()

Drop the foreign key

**class** anyblok.migration.**MigrationColumn** (*table, name*)

get or add a column

Add a new column:

```
table.column().add(Sqlalchemy column)
```

Get a column:

```
c = table.column('My column name')
```

Alter the column:

```
c.alter(new_column_name='Another column name')
```

Drop the column:

```
c.drop()
```

**add** (*column*)

Add a new column

The column is added in two phases, the last phase is only for the nullable, if nullable can not be applied, a warning is logged

**Parameters** `column` – sqlalchemy column

**Return type** MigrationColumn instance

**alter** (*\*\*kwargs*)

Alter an existing column

Alter the column in two phases, because the nullable column has not locked the migration

**Warning:** See Alembic `alter_column`, the `existing_*` param are used for some dialect like mysql, is importante to filled them for these dialect

**Parameters**

- **new\_column\_name** – New name for the column
- **type** – New sqlalchemy type
- **existing\_type** – Old sqlalchemy type
- **server\_default** – The default value in database server
- **existing\_server\_default** – Old default value
- **nullable** – New nullable value
- **existing\_nullable** – Old nullable value
- **autoincrement** – New auto increment use for Integer whith primary key only
- **existing\_autoincrement** – Old auto increment

**Return type** MigrationColumn instance

**drop** ()

Drop the column

**nullable** ()

Use for unittest return if the column is nullable

**server\_default** ()

Use for unittest: return the default database value

**type** ()

Use for unittest: return the column type

**class** `anyblok.migration.MigrationConstraintCheck` (*table, name*)

Used for the Check constraint

Add a new constraint:

```
table('My table name').check().add('check_my_column', 'mycolumn > 5')
```

Get and drop the constraint:

```
table('My table name').check('check_my_column').drop()
```

**add** (*condition*)

Add the constraint

**Parameters** `condition` – constraint to apply

**Return type** MigrationConstraintCheck instance

**drop()**

Drop the constraint

**class** anyblok.migration.**MigrationConstraintUnique**(table, name)

Used for the Unique constraint

Add a new constraint:

```
table('My table name').unique('constraint name').add('col1', 'col2')
```

Get and drop the constraint:

```
table('My table name').unique('constraint name').drop()
```

Let AnyBlok to define the name of the constraint:

```
table('My table name').unique(None).add('col1', 'col2')
```

**add(\*columns)**

Add the constraint

**Parameters** \*column – list of column name

**Return type** MigrationConstraintUnique instance

**Exception** MigrationException

**drop()**

Drop the constraint

**class** anyblok.migration.**MigrationConstraintPrimaryKey**(table)

Used for the primary key constraint

Add a new constraint:

```
table('My table name').primarykey().add('col1', 'col2')
```

Get and drop the constraint:

```
table('My table name').primarykey('col1', 'col2').drop()
```

**add(\*columns)**

Add the constraint

**Parameters** \*column – list of column name

**Return type** MigrationConstraintPrimaryKey instance

**Exception** MigrationException

**drop()**

Drop the constraint

**class** anyblok.migration.**MigrationIndex**(table, \*columns, \*\*kwargs)

Used for the index constraint

Add a new constraint:

```
table('My table name').index().add('col1', 'col2')
```

Get and drop the constraint:

```
table('My table name').index('col1', 'col2').drop()
```

**add** (\*columns)

Add the constraint

**Parameters** \*column – list of column name

**Return type** MigrationIndex instance

**Exception** MigrationException

**drop** ()

Drop the constraint

**class** anyblok.migration.**MigrationTable** (migration, name)

Use to manipulate tables

Add a table:

```
table().add('New table')
```

Get an existing table:

```
t = table('My table name')
```

Alter the table:

```
t.alter(name='Another table name')
```

Drop the table:

```
t.drop()
```

**add** (name)

Add a new table

**Parameters** name – name of the table

**Return type** MigrationTable instance

**alter** (\*\*kwargs)

Alter the current table

**Parameters** name – New table name

**Return type** MigrationTable instance

**Exception** MigrationException

**check** (name=None)

Get check

**Parameters** \*columns – List of the column's name

**Return type** MigrationConstraintCheck instance

**column** (name=None)

Get Column

**Parameters** name – Column name

**Return type** MigrationColumn instance

**drop** ()

Drop the table

**foreign\_key** (name)

Get a foreign key

**Return type** MigrationConstraintForeignKey instance

**index** (\*columns, \*\*kwargs)

Get index

**Parameters** \*columns – List of the column's name

**Return type** MigrationIndex instance

**primarykey** ()

Get primary key

**Parameters** \*columns – List of the column's name

**Return type** MigrationConstraintPrimaryKey instance

**unique** (name)

Get unique

**Parameters** \*columns – List of the column's name

**Return type** MigrationConstraintUnique instance

**class** anyblok.migration.**Migration** (registry)

Migration Main entry

This class allows to manipulate all the migration class:

```
migration = Migration(Session(), Base.Metadata)
t = migration.table('My table name')
c = t.column('My column name from t')
```

**auto\_upgrade\_database** ()

Upgrade the database automatically

**detect\_changed** ()

Detect the difference between the metadata and the database

**Return type** MigrationReport instance

**release\_savepoint** (name)

Release the save point

**Parameters** name – name of the savepoint

**rollback\_savepoint** (name)

Rollback to the savepoint

**Parameters** name – name of the savepoint

**savepoint** (name=None)

Add a savepoint

**Parameters** name – name of the save point

**Return type** return the name of the save point

**table** (name=None)

Get a table

**Return type** MigrationTable instance

## 6.12 anyblok.field module

**class** `anyblok.field.Field(*args, **kwargs)`

Field class

This class must not be instantiated

**forbid\_instance** (*cls*)

Raise an exception if the cls is an instance of this `__class__`

**Parameters** *cls* – instance of the class

**Exception** `FieldException`

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** *fieldname* – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the get is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Return the instance of the real field

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known of the model

**Return type** instance of `Field`

**must\_be\_declared\_as\_attr** ()

Return False, it is the default value

**must\_be\_duplicate\_before\_added** ()

Return False, it is the default value

**native\_type** ()

Return the native SQLAlchemy type

**Exception** `FieldException`

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the propertie use to add new column

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

**class** anyblok.field.**Function** (\*args, \*\*kwargs)

Bases: anyblok.field.Field

Function Field

```
from anyblok.declarations import Declarations
from anyblok.field import Function

@Declarations.register(Declarations.Model)
class Test:
    x = Function(fget='fget', fset='fset', fdel='fdel', fexp='fexpr')

..warning::

    fexp must be a classmethod
```

**forbid\_instance** (*cls*)

Raise an exception if the cls is an instance of this \_\_class\_\_

**Parameters** **cls** – instance of the class

**Exception** FieldException

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** **fieldname** – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the get is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field

- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**must\_be\_declared\_as\_attr** ()

Return False, it is the default value

**must\_be\_duplicate\_before\_added** ()

Return False, it is the default value

**native\_type** ()

Return the native SQLAlchemy type

**Exception** FieldException

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the property use to add new column

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

## 6.13 anyblok.column module

**class** anyblok.column.**Column** (*\*args, \*\*kwargs*)

Bases: anyblok.field.Field

Column class

This class can't be instantiated

**forbid\_instance** (*cls*)

Raise an exception if the cls is an instance of this \_\_class\_\_

**Parameters** **cls** – instance of the class

**Exception** FieldException



**format\_label** (*fieldname*)

Return the label for this field

**Parameters** **fieldname** – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the get is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Return the instance of the real field

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – known properties of the model

**Return type** sqlalchemy column instance

**must\_be\_declared\_as\_attr** ()

Return True if the column have a foreign key to a remote column

**must\_be\_duplicate\_before\_added** ()

Return False, it is the default value

**native\_type** ()

Return the native SQLAlchemy type

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the propertie use to add new column

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** *fieldname* – name of the field

**class** `anyblok.column.Integer(*args, **kwargs)`

Bases: `anyblok.column.Column`

Integer column

```
from anyblok.declarations import Declarations
from anyblok.column import Integer

@Declarations.register(Declarations.Model)
class Test:

    x = Integer(default=1)
```

**forbid\_instance** (*cls*)

Raise an exception if the *cls* is an instance of this `__class__`

**Parameters** *cls* – instance of the class

**Exception** `FieldException`

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** *fieldname* – if no label filled, the *fieldname* will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the `get` is called in `classattribute`, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Return the instance of the real field

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – known properties of the model

**Return type** sqlalchemy column instance

**must\_be\_declared\_as\_attr** ()

Return True if the column have a foreign key to a remote column

**must\_be\_duplicate\_before\_added** ()

Return False, it is the default value

**native\_type()**

Return the native SQLAlchemy type

**sqlalchemy\_type**

alias of Integer

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the propertie use to add new column

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

**class** anyblok.column.**SmallInteger** (*\*args, \*\*kwargs*)

Bases: anyblok.column.Column

Small integer column

```
from anyblok.declarations import Declarations
from anyblok.column import SmallInteger

@Declarations.register(Declarations.Model)
class Test:

    x = SmallInteger(default=1)
```

**forbid\_instance** (*cls*)

Raise an exception if the cls is an instance of this \_\_class\_\_

**Parameters** **cls** – instance of the class

**Exception** FieldException

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** **fieldname** – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the get is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)  
Return the instance of the real field

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – known properties of the model

**Return type** sqlalchemy column instance

**must\_be\_declared\_as\_attr** ()  
Return True if the column have a foreign key to a remote column

**must\_be\_duplicate\_before\_added** ()  
Return False, it is the default value

**native\_type** ()  
Return the native SQLAlchemy type

**sqlalchemy\_type**  
alias of `SmallInteger`

**update\_properties** (*registry, namespace, fieldname, properties*)  
Update the propertie use to add new column

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)  
Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)  
Return a default getter for the field

**Parameters** **fieldname** – name of the field

**class** `anyblok.column.BigInteger` (*\*args, \*\*kwargs*)  
Bases: `anyblok.column.Column`  
Big integer column

```
from anyblok.declarations import Declarations
from anyblok.column import BigInteger
```

```
@Declarations.register(Declarations.Model)
class Test:

    x = BigInteger(default=1)
```

**forbid\_instance** (*cls*)

Raise an exception if the cls is an instance of this \_\_class\_\_

**Parameters** **cls** – instance of the class

**Exception** FieldException

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** **fieldname** – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the get is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Return the instance of the real field

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – known properties of the model

**Return type** sqlalchemy column instance

**must\_be\_declared\_as\_attr** ()

Return True if the column have a foreign key to a remote column

**must\_be\_duplicate\_before\_added** ()

Return False, it is the default value

**native\_type** ()

Return the native SQLAlchemy type

**sqlalchemy\_type**

alias of BigInteger

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the propertie use to add new column

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

**class** `anyblok.column.Boolean` (*\*args, \*\*kwargs*)

Bases: `anyblok.column.Column`

Boolean column

```
from anyblok.declarations import Declarations
from anyblok.column import Boolean

@Declarations.register(Declarations.Model)
class Test:

    x = Boolean(default=True)
```

**forbid\_instance** (*cls*)

Raise an exception if the *cls* is an instance of this `__class__`

**Parameters** **cls** – instance of the class

**Exception** `FieldException`

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** **fieldname** – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the `get` is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Return the instance of the real field

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – known properties of the model

**Return type** sqlalchemy column instance

**must\_be\_declared\_as\_attr()**

Return True if the column have a foreign key to a remote column

**must\_be\_duplicate\_before\_added()**

Return False, it is the default value

**native\_type()**

Return the native SQLAlchemy type

**sqlalchemy\_type**

alias of Boolean

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the propertie use to add new column

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

**class** anyblok.column.**Float** (*\*args, \*\*kwargs*)

Bases: anyblok.column.Column

Float column

```
from anyblok.declarations import Declarations
from anyblok.column import Float

@Declarations.register(Declarations.Model)
class Test:

    x = Float(default=1.0)
```

**forbid\_instance** (*cls*)

Raise an exception if the cls is an instance of this \_\_class\_\_

**Parameters** **cls** – instance of the class

**Exception** FieldException

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** **fieldname** – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the get is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Return the instance of the real field

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – known properties of the model

**Return type** sqlalchemy column instance

**must\_be\_declared\_as\_attr** ()

Return True if the column have a foreign key to a remote column

**must\_be\_duplicate\_before\_added** ()

Return False, it is the default value

**native\_type** ()

Return the native SQLAlchemy type

**sqlalchemy\_type**

alias of Float

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the propertie use to add new column

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field



**wrap\_getter\_column** (*fieldname*)  
Return a default getter for the field

**Parameters** **fieldname** – name of the field

**class** `anyblok.column.Decimal (*args, **kwargs)`  
Bases: `anyblok.column.Column`

Decimal column

```
from decimal import Decimal as D
from anyblok.declarations import Declarations
from anyblok.column import Decimal

@Declarations.register(Declarations.Model)
class Test:

    x = Decimal(default=D('1.1'))
```

**forbid\_instance** (*cls*)  
Raise an exception if the *cls* is an instance of this `__class__`

**Parameters** **cls** – instance of the class

**Exception** `FieldException`

**format\_label** (*fieldname*)  
Return the label for this field

**Parameters** **fieldname** – if no label filled, the *fieldname* will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)  
Return the property of the field

**Warning:** In the case of the `get` is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)  
Return the instance of the real field

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – known properties of the model

**Return type** sqlalchemy column instance

**must\_be\_declared\_as\_attr()**

Return True if the column have a foreign key to a remote column

**must\_be\_duplicate\_before\_added()**

Return False, it is the default value

**native\_type()**

Return the native SQLAlchemy type

**sqlalchemy\_type**

alias of DECIMAL

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the propertie use to add new column

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

**class** `anyblok.column.Date` (*\*args, \*\*kwargs*)

Bases: `anyblok.column.Column`

Date column

```
from datetime import date
from anyblok.declarations import Declarations
from anyblok.column import Date
```

```
@Declarations.register(Declarations.Model)
```

```
class Test:
```

```
    x = Date(default=date.today())
```

**forbid\_instance** (*cls*)

Raise an exception if the cls is an instance of this `__class__`

**Parameters** **cls** – instance of the class

**Exception** `FieldException`

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** **fieldname** – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the get is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

#### Parameters

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Return the instance of the real field

#### Parameters

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – known properties of the model

**Return type** sqlalchemy column instance

**must\_be\_declared\_as\_attr** ()

Return True if the column have a foreign key to a remote column

**must\_be\_duplicate\_before\_added** ()

Return False, it is the default value

**native\_type** ()

Return the native SQLAlchemy type

**sqlalchemy\_type**

alias of Date

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the propertie use to add new column

#### Parameters

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

```
class anyblok.column.DateTime(*args, **kwargs)
```

Bases: `anyblok.column.Column`

DateTime column

```
from datetime import datetime
from anyblok.declarations import Declarations
from anyblok.column import DateTime

@Declarations.register(Declarations.Model)
class Test:

    x = DateTime(default=datetime.now)
```

**forbid\_instance** (*cls*)

Raise an exception if the *cls* is an instance of this `__class__`

**Parameters** *cls* – instance of the class

**Exception** `FieldException`

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** *fieldname* – if no label filled, the *fieldname* will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the `get` is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Return the instance of the real field

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – known properties of the model

**Return type** sqlalchemy column instance

**must\_be\_declared\_as\_attr** ()

Return True if the column have a foreign key to a remote column

**must\_be\_duplicate\_before\_added** ()

Return False, it is the default value

**native\_type()**

Return the native SQLAlchemy type

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the property use to add new column

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

**class** `anyblok.column.Time(*args, **kwargs)`

Bases: `anyblok.column.Column`

Time column

```
from datetime import time
from anyblok.declarations import Declarations
from anyblok.column import Time

@Declarations.register(Declarations.Model)
class Test:

    x = Time(default=time())
```

**forbid\_instance** (*cls*)

Raise an exception if the cls is an instance of this \_\_class\_\_

**Parameters** **cls** – instance of the class

**Exception** `FieldException`

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** **fieldname** – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the get is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry

- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Return the instance of the real field

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – known properties of the model

**Return type** sqlalchemy column instance

**must\_be\_declared\_as\_attr** ()

Return True if the column have a foreign key to a remote column

**must\_be\_duplicate\_before\_added** ()

Return False, it is the default value

**native\_type** ()

Return the native SQLAlchemy type

**sqlalchemy\_type**

alias of Time

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the propertie use to add new column

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

**class** anyblok.column.**Interval** (*\*args, \*\*kwargs*)

Bases: anyblok.column.Column

Datetime interval column

```
from datetime import timedelta
from anyblok.declarations import Declarations
from anyblok.column import Interval
```

```
@Declarations.register(Declarations.Model)
```

```
class Test:
```

```
    x = Interval(default=timedelta(days=5))
```

**forbid\_instance** (*cls*)

Raise an exception if the cls is an instance of this \_\_class\_\_

**Parameters** **cls** – instance of the class

**Exception** FieldException

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** **fieldname** – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the get is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Return the instance of the real field

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – known properties of the model

**Return type** sqlalchemy column instance

**must\_be\_declared\_as\_attr** ()

Return True if the column have a foreign key to a remote column

**must\_be\_duplicate\_before\_added** ()

Return False, it is the default value

**native\_type** ()

Return the native SQLAlchemy type

**sqlalchemy\_type**

alias of Interval

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the propertie use to add new column

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

**class** `anyblok.column.String` (\*args, \*\*kwargs)

Bases: `anyblok.column.Column`

String column

```
from anyblok.declarations import Declarations
from anyblok.column import String

@Declarations.register(Declarations.Model)
class Test:

    x = String(default='test')
```

**forbid\_instance** (*cls*)

Raise an exception if the cls is an instance of this \_\_class\_\_

**Parameters** **cls** – instance of the class

**Exception** `FieldException`

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** **fieldname** – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the get is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Return the instance of the real field

**Parameters**



- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – known properties of the model

**Return type** sqlalchemy column instance

**must\_be\_declared\_as\_attr()**

Return True if the column have a foreign key to a remote column

**must\_be\_duplicate\_before\_added()**

Return False, it is the default value

**native\_type()**

Return the native SQLAlchemy type

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the propertie use to add new column

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

**class** anyblok.column.uString (*\*args, \*\*kwargs*)

Bases: anyblok.column.Column

Unicode column

```
from anyblok.declarations import Declarations
from anyblok.column import uString
```

```
@Declarations.register(Declarations.Model)
class Test:
```

```
    x = uString(de", default=u'test')
```

**forbid\_instance** (*cls*)

Raise an exception if the cls is an instance of this \_\_class\_\_

**Parameters** **cls** – instance of the class

**Exception** FieldException

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** **fieldname** – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the get is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Return the instance of the real field

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – known properties of the model

**Return type** sqlalchemy column instance

**must\_be\_declared\_as\_attr** ()

Return True if the column have a foreign key to a remote column

**must\_be\_duplicate\_before\_added** ()

Return False, it is the default value

**native\_type** ()

Return the native SQLAlchemy type

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the propertie use to add new column

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

**class** anyblok.column.**Text** (\*args, \*\*kwargs)

Bases: anyblok.column.Column

Text column

```
from anyblok.declarations import Declarations
from anyblok.column import Text

@Declarations.register(Declarations.Model)
class Test:

    x = Text(default='test')
```

**forbid\_instance** (cls)

Raise an exception if the cls is an instance of this \_\_class\_\_

**Parameters** **cls** – instance of the class

**Exception** FieldException

**format\_label** (fieldname)

Return the label for this field

**Parameters** **fieldname** – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (registry, namespace, fieldname, properties)

Return the property of the field

**Warning:** In the case of the get is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (registry, namespace, fieldname, properties)

Return the instance of the real field

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – known properties of the model

**Return type** sqlalchemy column instance

**must\_be\_declared\_as\_attr** ()

Return True if the column have a foreign key to a remote column

**must\_be\_duplicate\_before\_added** ()

Return False, it is the default value

**native\_type()**

Return the native SQLAlchemy type

**update\_properties**(*registry, namespace, fieldname, properties*)

Update the property use to add new column

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column**(*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column**(*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

**class** `anyblok.column.uText(*args, **kwargs)`

Bases: `anyblok.column.Column`

Unicode text column

```
from anyblok.declarations import Declarations
from anyblok.column import uText

@Declarations.register(Declarations.Model)
class Test:

    x = uText(default=u'test')
```

**forbid\_instance**(*cls*)

Raise an exception if the cls is an instance of this \_\_class\_\_

**Parameters** **cls** – instance of the class

**Exception** `FieldException`

**format\_label**(*fieldname*)

Return the label for this field

**Parameters** **fieldname** – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property**(*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the get is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model

- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Return the instance of the real field

#### Parameters

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – known properties of the model

**Return type** sqlalchemy column instance

**must\_be\_declared\_as\_attr** ()

Return True if the column have a foreign key to a remote column

**must\_be\_duplicate\_before\_added** ()

Return False, it is the default value

**native\_type** ()

Return the native SQLAlchemy type

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the propertie use to add new column

#### Parameters

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

**class** anyblok.column.**StrSelection**

Class representing the data of one column Selection

**class** anyblok.column.**SelectionType** (*selections, size, registry=None, namespace=None*)

Generic type for Column Selection

**impl**

alias of String

**class** anyblok.column.**Selection** (*\*args, \*\*kwargs*)

Bases: anyblok.column.Column

Selection column

```
from anyblok.declarations import Declarations
from anyblok.column import Selection

@Declarations.register(Declarations.Model)
class Test:
    STATUS = (
        (u'draft', u'Draft'),
        (u'done', u'Done'),
    )

    x = Selection(selections=STATUS, size=64, default=u'draft')
```

**forbid\_instance** (*cls*)

Raise an exception if the *cls* is an instance of this `__class__`

**Parameters** *cls* – instance of the class

**Exception** `FieldException`

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** *fieldname* – if no label filled, the *fieldname* will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the `get` is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**must\_be\_declared\_as\_attr** ()

Return True if the column have a foreign key to a remote column

**must\_be\_duplicate\_before\_added** ()

Return True because the field selection in a mixin must be copied else the selection method can be wrong

**native\_type** ()

Return the native SQLAlchemy type

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the property use to add new column

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)  
Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)  
Return a default getter for the field

**Parameters** **fieldname** – name of the field

**class** `anyblok.column.JsonType` (*\*args, \*\*kwargs*)  
Generic type for Column JSON

**impl**  
alias of Unicode

**class** `anyblok.column.Json` (*\*args, \*\*kwargs*)  
Bases: `anyblok.column.Column`

JSON column

```
from anyblok.declarations import Declarations
from anyblok.column import Json

@Declarations.register(Declarations.Model)
class Test:

    x = Json()
```

**forbid\_instance** (*cls*)  
Raise an exception if the cls is an instance of this `__class__`

**Parameters** **cls** – instance of the class

**Exception** `FieldException`

**format\_label** (*fieldname*)  
Return the label for this field

**Parameters** **fieldname** – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)  
Return the property of the field

**Warning:** In the case of the get is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)  
Return the instance of the real field

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – known properties of the model

**Return type** sqlalchemy column instance

**must\_be\_declared\_as\_attr()**

Return True if the column have a foreign key to a remote column

**must\_be\_duplicate\_before\_added()**

Return False, it is the default value

**native\_type()**

Return the native SQLAlchemy type

**sqlalchemy\_type**

alias of JsonType

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the propertie use to add new column

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

**class** anyblok.column.**LargeBinary** (*\*args, \*\*kwargs*)

Bases: anyblok.column.Column

Large binary column

```
from os import urandom
from anyblok.declarations import Declarations
from anyblok.column import LargeBinary

blob = urandom(100000)

@Declarations.register(Declarations.Model)
class Test:

    x = LargeBinary(default=blob)
```

**forbid\_instance** (*cls*)

Raise an exception if the cls is an instance of this \_\_class\_\_



**Parameters** `cls` – instance of the class

**Exception** `FieldException`

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** `fieldname` – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the get is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Return the instance of the real field

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – known properties of the model

**Return type** sqlalchemy column instance

**must\_be\_declared\_as\_attr** ()

Return True if the column have a foreign key to a remote column

**must\_be\_duplicate\_before\_added** ()

Return False, it is the default value

**native\_type** ()

Return the native SQLAlchemy type

**sqlalchemy\_type**

alias of LargeBinary

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the propertie use to add new column

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

**class** `anyblok.column.Color` (\*args, \*\*kwargs)

Bases: `anyblok.column.Column`

Color column. See [coulour](#) package

```
from anyblok.declarations import Declarations
from anyblok.column import Color

@Declarations.register(Declarations.Model)
class Test:

    x = Color(default='green')
```

**forbid\_instance** (*cls*)

Raise an exception if the cls is an instance of this `__class__`

**Parameters** **cls** – instance of the class

**Exception** `FieldException`

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** **fieldname** – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the get is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Return the instance of the real field

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – known properties of the model

**Return type** sqlalchemy column instance

**must\_be\_declared\_as\_attr()**

Return True if the column have a foreign key to a remote column

**must\_be\_duplicate\_before\_added()**

Return False, it is the default value

**native\_type()**

Return the native SQLAlchemy type

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the propertie use to add new column

#### Parameters

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

**class** anyblok.column.**Password** (*\*args, \*\*kwargs*)

Bases: anyblok.column.Column

String column

```
from anyblok.declarations import Declarations
from anyblok.column import Password

@Declarations.register(Declarations.Model)
class Test:

    x = Password(crypt_context={'schemes': ['md5_crypt']})

    =====

test = Test.insert()
test.x = 'mypassword'

test.x
==> Password object with encrypt value, the value can not be read

test.x == 'mypassword'
==> True
```

..warning:

the column type Password can not be querying::

```
Test.query().filter(Test.x == 'mypassword').count()  
==> 0
```

**forbid\_instance** (*cls*)

Raise an exception if the *cls* is an instance of this \_\_class\_\_

**Parameters** *cls* – instance of the class

**Exception** FieldException

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** *fieldname* – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the *get* is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Return the instance of the real field

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – known properties of the model

**Return type** sqlalchemy column instance

**must\_be\_declared\_as\_attr** ()

Return True if the column have a foreign key to a remote column

**must\_be\_duplicate\_before\_added** ()

Return False, it is the default value

**native\_type** ()

Return the native SQLAlchemy type

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the propertie use to add new column

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field

- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

## 6.14 anyblok.relationship module

**class** anyblok.relationship.**Relationship** (*\*args, \*\*kwargs*)

Bases: anyblok.field.Field

Relationship class

The Relationship class is used to define the type of SQL field Declarations

Add a new relation ship type:

```
@Declarations.register(Declarations.Relationship)
class Many2One:
    pass
```

the relationship column are forbidden because the model can be used on the model

**apply\_instrumentedlist** (*registry, namespace, fieldname*)

Add the InstrumentedList class to replace List class as result of the query

**Parameters** **registry** – current registry

**define\_backref\_properties** (*registry, namespace, properties*)

Add in the backref\_properties, new property for the backref

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **properties** – properties known of the model

**forbid\_instance** (*cls*)

Raise an exception if the cls is an instance of this \_\_class\_\_

**Parameters** **cls** – instance of the class

**Exception** FieldException

**format\_backref** (*registry, namespace, fieldname, properties*)

Create the real backref, with the backref string and the backref properties

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known of the model

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** **fieldname** – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the get is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Return the instance of the real field

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known of the model

**Return type** sqlalchemy relation ship instance

**init\_expire\_attributes** (*registry, namespace, fieldname*)

Init dict of expiration properties

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field

**must\_be\_declared\_as\_attr** ()

Return True, because it is a relationship

**must\_be\_duplicate\_before\_added** ()

Return False, it is the default value

**native\_type** ()

Return the native SQLAlchemy type

**Exception** FieldException

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the propertie use to add new column

**Parameters**

- **registry** – current registry
- **namespace** – name of the model

- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

**class** anyblok.relationship.**Many2One** (*\*\*kwargs*)

Bases: anyblok.relationship.Relationship

Define a relationship attribute on the model

```
@register(Model)
class TheModel:

    relationship = Many2One(label="The relationship",
                             model=Model.RemoteModel,
                             remote_columns="The remote column",
                             column_names="The column which have the "
                                           "foreign key",
                             nullable=True,
                             unique=False,
                             one2many="themodels")
```

If the `remote_columns` are not define then, the system takes the primary key of the remote model

If the column doesn't exist, the column will be created. Use the nullable option. If the name is not filled, the name is "remote table'\_remote column"

#### Parameters

- **model** – the remote model
- **remote\_columns** – the column name on the remote model
- **column\_names** – the column on the model which have the foreign key
- **nullable** – If the column\_names is nullable
- **unique** – If True, add the unique constraint on the column
- **one2many** – create the one2many link with this many2one

**apply\_instrumentedlist** (*registry, namespace, fieldname*)

Add the InstrumentedList class to replace List class as result of the query

**Parameters** **registry** – current registry

**define\_backref\_properties** (*registry, namespace, properties*)

Add in the backref\_properties, new property for the backref

#### Parameters

- **registry** – current registry
- **namespace** – name of the model
- **properties** – properties known of the model

**forbid\_instance** (*cls*)

Raise an exception if the cls is an instance of this `__class__`

**Parameters** **cls** – instance of the class

**Exception** FieldException

**format\_backref** (*registry, namespace, fieldname, properties*)

Create the real backref, with the backref string and the backref properties

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known of the model

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** **fieldname** – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Create the relationship

**Parameters**

- **registry** – the registry which load the relationship
- **namespace** – the name space of the model
- **fieldname** – fieldname of the relationship
- **propertie** – the properties known

**Return type** Many2One relationship

**init\_expire\_attributes** (*registry, namespace, fieldname*)

Init dict of expiration properties

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field

**must\_be\_declared\_as\_attr** ()

Return True, because it is a relationship



**must\_be\_duplicate\_before\_added()**

Return False, it is the default value

**native\_type()**

Return the native SQLAlchemy type

**Exception** FieldException

**update\_properties** (*registry, namespace, fieldname, properties*)

Create the column which has the foreign key if the column doesn't exist

**Parameters**

- **registry** – the registry which load the relationship
- **namespace** – the name space of the model
- **fieldname** – fieldname of the relationship
- **propertie** – the properties known

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

**class** anyblok.relationship.**One2One** (*\*\*kwargs*)

Bases: anyblok.relationship.Many2One

Define a relationship attribute on the model

```
@register (Model)
class TheModel:

    relationship = One2One(label="The relationship",
                           model=Model.RemoteModel,
                           remote_columns="The remote column",
                           column_names="The column which have the "
                                       "foreign key",
                           nullable=False,
                           backref="themodels")
```

If the remote\_columns are not define then, the system take the primary key of the remote model

If the column doesn't exist, then the column will be create. Use the nullable option. If the name is not filled then the name is “‘remote table’\_remote colum”

**Parameters**

- **model** – the remote model
- **remote\_columns** – the column name on the remote model
- **column\_names** – the column on the model which have the foreign key
- **nullable** – If the column\_names is nullable
- **backref** – create the one2one link with this one2one

**apply\_instrumentedlist** (*registry, namespace, fieldname*)

Add the InstrumentedList class to replace List class as result of the query

**Parameters** **registry** – current registry

**define\_backref\_properties** (*registry, namespace, properties*)

Add option uselist = False

**Parameters**

- **registry** – the registry which load the relationship
- **namespace** – the name space of the model
- **property** – the properties known

**forbid\_instance** (*cls*)

Raise an exception if the cls is an instance of this \_\_class\_\_

**Parameters** **cls** – instance of the class

**Exception** FieldException

**format\_backref** (*registry, namespace, fieldname, properties*)

Create the real backref, with the backref string and the backref properties

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known of the model

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** **fieldname** – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Create the relationship

**Parameters**

- **registry** – the registry which load the relationship
- **namespace** – the name space of the model
- **fieldname** – fieldname of the relationship
- **property** – the properties known

**Return type** Many2One relationship

**init\_expire\_attributes** (*registry, namespace, fieldname*)

Init dict of expiration properties

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field

**must\_be\_declared\_as\_attr** ()

Return True, because it is a relationship

**must\_be\_duplicate\_before\_added** ()

Return False, it is the default value

**native\_type** ()

Return the native SQLAlchemy type

**Exception** FieldException

**update\_properties** (*registry, namespace, fieldname, properties*)

Create the column which has the foreign key if the column doesn't exist

**Parameters**

- **registry** – the registry which load the relationship
- **namespace** – the name space of the model
- **fieldname** – fieldname of the relationship
- **property** – the properties known

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

**class** anyblok.relationship.**Many2Many** (*\*\*kwargs*)

Bases: anyblok.relationship.RelationShip

Define a relationship attribute on the model

```
@register(Model)
class TheModel:

    relationship = Many2Many(label="The relationship",
                              model=Model.RemoteModel,
                              join_table="many2many table",
                              remote_columns="The remote column",
                              m2m_remote_columns="Name in many2many"
                              local_columns="local primary key"
                              m2m_local_columns="Name in many2many"
                              many2many="themodels")
```

if the **join\_table** is not defined, then the table join is “join\_’local table’\_and\_’remote table’”

**Warning:** The `join_table` must be filled when the declaration of the `Many2Many` is done in a `Mixin`

If the `remote_columns` are not define then, the system take the primary key of the remote model

**if the `local_columns` are not define the take the primary key of the local model**

#### Parameters

- **model** – the remote model
- **join\_table** – the many2many table to join local and remote models
- **remote\_columns** – the column name on the remote model
- **m2m\_remote\_columns** – the column name to remote model in m2m table
- **local\_columns** – the column on the model
- **m2m\_local\_columns** – the column name to local model in m2m table
- **many2many** – create the opposite many2many on the remote model

**apply\_instrumentedlist** (*registry, namespace, fieldname*)

Add the InstrumentedList class to replace List class as result of the query

**Parameters** **registry** – current registry

**define\_backref\_properties** (*registry, namespace, properties*)

Add in the backref\_properties, new property for the backref

#### Parameters

- **registry** – current registry
- **namespace** – name of the model
- **properties** – properties known of the model

**forbid\_instance** (*cls*)

Raise an exception if the `cls` is an instance of this `__class__`

**Parameters** **cls** – instance of the class

**Exception** `FieldException`

**format\_backref** (*registry, namespace, fieldname, properties*)

Create the real backref, with the backref string and the backref properties

#### Parameters

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known of the model

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** **fieldname** – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the get is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

#### Parameters

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Create the relationship

#### Parameters

- **registry** – the registry which load the relationship
- **namespace** – the name space of the model
- **fieldname** – fieldname of the relationship
- **properties** – the properties known

**Return type** Many2One relationship

**init\_expire\_attributes** (*registry, namespace, fieldname*)

Init dict of expiration properties

#### Parameters

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field

**must\_be\_declared\_as\_attr** ()

Return True, because it is a relationship

**must\_be\_duplicate\_before\_added** ()

Return False, it is the default value

**native\_type** ()

Return the native SQLAlchemy type

**Exception** FieldException

**update\_properties** (*registry, namespace, fieldname, properties*)

Update the propertie use to add new column

#### Parameters

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column** (*fieldname*)

Return a default expr for the field

**Parameters** *fieldname* – name of the field

**wrap\_getter\_column** (*fieldname*)

Return a default getter for the field

**Parameters** *fieldname* – name of the field

**class** anyblok.relationship.**One2Many** (*\*\*kwargs*)

Bases: anyblok.relationship.Relationship

Define a relationship attribute on the model

```
@register(Model)
class TheModel:

    relationship = One2Many(label="The relationship",
                           model=Model.RemoteModel,
                           remote_columns="The remote column",
                           primaryjoin="Join condition"
                           many2one="themodel")
```

If the **primaryjoin** is not filled then the join condition is “‘local table’.local primary key’ == ‘remote table’.remote column”

**Parameters**

- **model** – the remote model
- **remote\_columns** – the column name on the remote model
- **primaryjoin** – the join condition between the remote column
- **many2one** – create the many2one link with this one2many

**apply\_instrumentedlist** (*registry, namespace, fieldname*)

Add the InstrumentedList class to replace List class as result of the query

**Parameters** **registry** – current registry

**define\_backref\_properties** (*registry, namespace, properties*)

Add option in the backref if both model and remote model are the same, it is for the One2Many on the same model

**Parameters**

- **registry** – the registry which load the relationship
- **namespace** – the name space of the model
- **property** – the properties known

**find\_foreign\_key** (*registry, properties, tablename*)

Return the primary key come from the first step property

**Parameters**

- **registry** – the registry which load the relationship
- **properties** – first step properties for the model
- **tablename** – the name of the table for the foreign key

**Return type** column name of the primary key

**forbid\_instance** (*cls*)

Raise an exception if the cls is an instance of this `__class__`

**Parameters** **cls** – instance of the class

**Exception** `FieldException`

**format\_backref** (*registry, namespace, fieldname, properties*)

Create the real backref, with the backref string and the backref properties

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known of the model

**format\_label** (*fieldname*)

Return the label for this field

**Parameters** **fieldname** – if no label filled, the fieldname will be capitalized and returned

**Return type** the label for this field

**get\_property** (*registry, namespace, fieldname, properties*)

Return the property of the field

**Warning:** In the case of the get is called in classattribute, SQLAlchemy wrap for each call the column, the id of the wrapper is not the same

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**get\_sqlalchemy\_mapping** (*registry, namespace, fieldname, properties*)

Create the relationship

**Parameters**

- **registry** – the registry which load the relationship
- **namespace** – the name space of the model
- **fieldname** – fieldname of the relationship
- **propertie** – the properties known

**Return type** Many2One relationship

**init\_expire\_attributes** (*registry, namespace, fieldname*)

Init dict of expiration properties

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field

**must\_be\_declared\_as\_attr** ()

Return True, because it is a relationship

**must\_be\_duplicate\_before\_added()**

Return False, it is the default value

**native\_type()**

Return the native SQLAlchemy type

**Exception** FieldException

**update\_properties**(*registry, namespace, fieldname, properties*)

Update the propertie use to add new column

**Parameters**

- **registry** – current registry
- **namespace** – name of the model
- **fieldname** – name of the field
- **properties** – properties known to the model

**wrap\_expr\_column**(*fieldname*)

Return a default expr for the field

**Parameters** **fieldname** – name of the field

**wrap\_getter\_column**(*fieldname*)

Return a default getter for the field

**Parameters** **fieldname** – name of the field

## 6.15 anyblok.\_graphviz module

**class** anyblok.\_graphviz.**BaseSchema**(*name, format='png'*)

Common class extended by the type of schema

**add\_edge**(*cls\_1, cls\_2, attr=None*)

Add new edge between 2 node

```
dot.add_edge(node1, node2)
```

**Parameters**

- **cls\_1** – node (string or object) for the from
- **cls\_2** – node (string or object) for the to

**Paam attr** attribute of the edge

**render()**

Call graphviz to do the schema

**save()**

render and create the output file

**class** anyblok.\_graphviz.**SQLSchema**(*name, format='png'*)

Create a schema to display the table model

```
dot = SQLSchema('the name of my schema')
t1 = dot.add_table('Table 1')
t1.add_column('c1', 'Integer')
t1.add_column('c2', 'Integer')
```



```
t2 = dot.add_table('Table 2')
t2.add_column('c1', 'Integer')
t2.add_foreign_key(t1, 'c2')
dot.save()
```

**add\_label** (*name*)

Add a new node TableSchema without column

**Parameters** **name** – name of the table

**Return type** return the instance of TableSchema

**add\_table** (*name*)

Add a new node TableSchema with column

**Parameters** **name** – name of the table

**Return type** return the instance of TableSchema

**get\_table** (*name*)

Return the instance of TableSchema linked with the name of table

**Parameters** **name** – name of the table

**Return type** return the instance of TableSchema

**class** anyblok.\_graphviz.**TableSchema** (*name, parent, islabel=False*)

Describe one table

**add\_column** (*name, type\_, primary\_key=False*)

Add a new column in the table

**Parameters**

- **name** – name of the column
- **type** – type of the column
- **primary\_key** – if True, the string PK will be add

**add\_foreign\_key** (*node, label=None, nullable=True*)

Add a new foreign key

**Parameters**

- **node** – node (string or object) of the table linked
- **label** – name of the column of the foreign key
- **nullable** – bool to select the multiplicity of the association

**render** (*dot*)

Call graphviz to create the schema

**class** anyblok.\_graphviz.**ModelSchema** (*name, format='png'*)

Create a schema to display the UML model

```
dot = ModelSchema('The name of my UML schema')
cls = dot.add_class('My class')
cls.add_method('insert')
cls.add_property('items')
cls.add_column('my column')
dot.save()
```

**add\_class** (*name*)

Add a new node ClassSchema with column

**Parameters** **name** – name of the class

**Return type** return the instance of ClassSchema

**add\_label** (*name*)

Return the instance of ClassSchema linked with the name of class

**Parameters** **name** – name of the class

**Return type** return the instance of ClassSchema

**get\_class** (*name*)

Add a new node ClassSchema without column

**Parameters** **name** – name of the class

**Return type** return the instance of ClassSchema

**class** anyblok.\_graphviz.**ClassSchema** (*name, parent, islabel=False*)

Use to display a class

**add\_column** (*name*)

add a column in the class

**Parameters** **name** – name of the column

**add\_method** (*name*)

add a method in the class

**Parameters** **name** – name of the method

**add\_property** (*name*)

add a property in the class

**Parameters** **name** – name of the property

**agregate** (*node, label\_from=None, multiplicity\_from=None, label\_to=None, multiplicity\_to=None*)

add an edge with agregate shape to the node

**Parameters**

- **node** – node (string or object)
- **label\_from** – attribute name
- **multiplicity\_from** – multiplicity of the attribute
- **label\_to** – attribute name
- **multiplicity\_to** – multiplicity of the attribute

**associate** (*node, label\_from=None, multiplicity\_from=None, label\_to=None, multiplicity\_to=None*)

add an edge with associate shape to the node

**Parameters**

- **node** – node (string or object)
- **label\_from** – attribute name
- **multiplicity\_from** – multiplicity of the attribute
- **label\_to** – attribute name
- **multiplicity\_to** – multiplicity of the attribute

**extend** (*node*)

add an edge with extend shape to the node

**Parameters** **node** – node (string or object)

**render** (*dot*)

Call graphviz to do the schema

**strong\_aggregate** (*node, label\_from=None, multiplicity\_from=None, label\_to=None, multiplicity\_to=None*)

add an edge with strong aggregate shape to the node

**Parameters**

- **node** – node (string or object)
- **label\_from** – attribute name
- **multiplicity\_from** – multiplicity of the attribute
- **label\_to** – attribute name
- **multiplicity\_to** – multiplicity of the attribute

## 6.16 anyblok.scripts module

`anyblok.scripts.createdb` (*application, configuration\_groups, \*\*kwargs*)

Create a database and install blok from config

**Parameters**

- **application** – name of the application
- **configuration\_groups** – list configuration groupe to load
- **\*\*kwargs** – ArgumentParser named arguments

`anyblok.scripts.updatedb` (*application, configuration\_groups, \*\*kwargs*)

Update an existing database

**Parameters**

- **application** – name of the application
- **configuration\_groups** – list configuration groupe to load
- **\*\*kwargs** – ArgumentParser named arguments

`anyblok.scripts.interpreter` (*application, configuration\_groups, \*\*kwargs*)

Execute a script or open an interpreter

**Parameters**

- **application** – name of the application
- **configuration\_groups** – list configuration groupe to load
- **\*\*kwargs** – ArgumentParser named arguments

`anyblok.scripts.run_exit` (*application, configuration\_groups, \*\*kwargs*)

Run nose unit test for the registry

**Parameters**

- **application** – name of the application
- **configuration\_groups** – list configuration groupe to load
- **\*\*kwargs** – ArgumentParser named arguments

`anyblok.scripts.cron_worker(application, configuration_groups, **kwargs)`  
Execute a cron worker

**Parameters**

- **application** – name of the application
- **configuration\_groups** – list configuration groupe to load
- **\*\*kwargs** – ArgumentParser named arguments

`anyblok.scripts.registry2doc(application, configuration_groups, **kwargs)`  
Return auto documentation for the registry

**Parameters**

- **application** – name of the application
- **configuration\_groups** – list configuration groupe to load
- **\*\*kwargs** – ArgumentParser named arguments

**Contents**

- *Helpers for unittest*
  - *TestCase*
  - *DBTestCase*
  - *BlokTestCase*
  - *LogCapture*

---

## Helpers for unittest

---

AnyBlok provides base test classes to help creating fixtures. Blok developers will be mostly interested in `BlokTestCase`. Base classes for unit/integration tests with anyblok.

This module provides `BlokTestCase`, which is the main one meant for blok tests, and `DBTestCase`, whose primary purpose is to test anyblok itself, in so-called “framework tests”.

### 7.1 TestCase

```
from anyblok.tests.testcase import TestCase
```

**class** anyblok.tests.testcase.**TestCase** (*methodName='runTest'*)

Bases: unittest.case.TestCase

Common helpers, not meant to be used directly.

**Configuration** (*\*\*values*)

Add Configuration value only in the contextmanager

```
with TestCase.Configuration(db_name='a db name'):
    self.assertEqual(Configuration.get('db_name'), 'a db name')
```

**Parameters** **\*\*values** – values to update

**classmethod** **additional\_setting** ()

**callCleanUp** ()

**cleanUp** ()

**classmethod** **createdb** (*keep\_existing=False*)

Create the database specified in configuration.

```
cls.init_configuration_manager()
cls.createdb()
```

**Parameters** **keep\_existing** – If false drop the previous db before create it

**classmethod** **dropdb** ()

Drop the database specified in configuration.

```
cls.init_configuration_manager()
cls.dropdb()
```

**classmethod** `getRegistry()`

Return the registry for the test database.

This assumes the database is created, and the registry has already been initialized:

```
registry = self.getRegistry()
```

**Return type** registry instance

**classmethod** `init_configuration_manager(**env)`

Initialise the configuration manager with environ variable to launch the test

**Warning:** For the moment we not use the environ variable juste constante

**Parameters**

- **prefix** – prefix the database name
- **env** – add another dict to merge with environ variable

**setUp()**

**tearDown()**

Roll back the session

## 7.2 DBTestCase

**Warning:** this testcase destroys the test database for each unittest

**class** `anyblok.tests.testcase.DBTestCase(methodName='runTest')`

Bases: `anyblok.tests.testcase.TestCase`

Base class for tests that need to work on an empty database.

**Warning:** The database is created and dropped with each unit test

For instance, this is the one used for Field, Column, Relationship, and more generally core framework tests.

The drawback of using this base class is that tests will be slow. The advantage is ultimate test isolation.

Sample usage:

```
from anyblok.tests.testcase import DBTestCase

def simple_column(ColumnType=None, **kwargs):
    @Declarations.register(Declarations.Model)
    class Test:
        id = Declarations.Column.Integer(primary_key=True)
        col = ColumnType(**kwargs)

    class TestColumns(DBTestCase):
        def test_integer(self):
```

```
Integer = Declarations.Column.Integer

registry = self.init_registry(simple_column,
                             ColumnType=Integer)

test = registry.Test.insert(col=1)
self.assertEqual(test.col, 1)
```

**blok\_entry\_points** = ('bloks',)  
setuptools entry points to load blok

**init\_registry** (*function*, *\*\*kwargs*)  
call a function to filled the blok manager with new model

#### Parameters

- **function** – function to call
- **kwargs** – kwargs for the function

**Return type** registry instance

**setUp** ()  
Create a database and load the blok manager

**classmethod setUpClass** ()  
Initialialise the configuration manager

**tearDown** ()  
Clear the registry, unload the blok manager and drop the database

## 7.3 BlokTestCase

**class** anyblok.tests.testcase.**BlokTestCase** (*methodName='runTest'*)  
Bases: unittest.case.TestCase

Base class for tests meant to run on a preinstalled database.

The tests written with this class don't need to start afresh on a new database, and therefore run much faster than those inheriting DBTestCase. Instead, they expect the tested bloks to be already installed and up to date.

The session gets rollbacked after each test.

Such tests are appropriate for a typical blok developer workflow:

- create and install the bloks once
- run the tests of the blok under development repeatedly
- upgrade the bloks in database when needed (schema change, update of dependencies)

They are also appropriate for on the fly testing while installing the bloks: the tests of each blok get run on the database state they expect, before dependent (downstream) bloks, that could. e.g., alter the database schema, get themselves installed. This is useful to test a whole stack at once using only one database (typically in CI bots).

Sample usage:

```
from anyblok.tests.testcase import BlokTestCase

class MyBlokTest(BlokTestCase):

    def test_1(self):
```

```
# access to the registry by ``self.registry``  
...
```

```
classmethod additional_setting()  
callCleanUp()  
cleanUp()  
registry = None  
    The instance of anyblok.registry.Registry to use in tests.  
    The session_commit() method is disabled to avoid side effects from one test to the other.  
setUp()  
classmethod setUpClass()  
    Initialize the registry.  
tearDown()  
    Roll back the session
```

## 7.4 LogCapture

```
class anyblok.tests.testcase.LogCapture(names=None, install=True, level=1, propagate=None, attributes=('name', 'levelname', 'getMessage'))  
Bases: testfixtures.logcapture.LogCapture  
Overwrite testfixtures.LogCapture to add some helper methods  
acquire()  
    Acquire the I/O thread lock.  
actual()  
addFilter(filter)  
    Add the specified filter to this handler.  
atexit()  
atexit_setup = False  
check(*expected)  
    This will compare the captured entries with the expected entries provided and raise an AssertionError if they do not match.  
    Parameters expected – A sequence of 3-tuples containing the expected log entries. Each tuple should be of the form (logger_name, string_level, message)  
clear()  
    Clear any entries that have been captured.  
close()  
    Tidy up any resources used by the handler.  
    This version removes the handler from an internal map of handlers, _handlers, which is used for handler lookup by name. Subclasses should ensure that this gets called from overridden close() methods.  
createLock()  
    Acquire a thread lock for serializing access to the underlying I/O.
```



**emit** (*record*)

**filter** (*record*)

Determine if a record is loggable by consulting all the filters.

The default is to allow the record to be logged; any filter can veto this and the record is then dropped. Returns a zero value if a record is to be dropped, else non-zero.

**flush** ()

Ensure all logging output has been flushed.

This version does nothing and is intended to be implemented by subclasses.

**format** (*record*)

Format the specified record.

If a formatter is set, use it. Otherwise, use the default formatter for the module.

**get\_critical\_messages** ()

Return only the logging.CRITICAL messages

**get\_debug\_messages** ()

Return only the logging.DEBUG messages

**get\_error\_messages** ()

Return only the logging.ERROR messages

**get\_info\_messages** ()

Return only the logging.INFO messages

**get\_messages** (*\*levels*)

Return the captured messages

```
with LogCapture() as logs:
    messages = logs.get_messages(INFO, WARNING)
```

**Parameters** *\*levels* – list of logging.level

**Return type** list of formatted message

**get\_name** ()

**get\_warning\_messages** ()

Return only the logging.WARNING messages

**handle** (*record*)

Conditionally emit the specified logging record.

Emission depends on filters which may have been added to the handler. Wrap the actual emission of the record with acquisition/release of the I/O thread lock. Returns whether the filter passed the record for emission.

**handleError** (*record*)

Handle errors which occur during an emit() call.

This method should be called from handlers when an exception is encountered during an emit() call. If raiseExceptions is false, exceptions get silently ignored. This is what is mostly wanted for a logging system - most users will not care about errors in the logging system, they are more interested in application errors. You could, however, replace this with a custom handler if you wish. The record which was being processed is passed in to this method.

**install** ()

Install this LogHandler into the Python logging framework for the named loggers.

This will remove any existing handlers for those loggers and drop their level to 1 in order to capture all logging.

**installed** = False

**instances** = set()

**name**

**release** ()

Release the I/O thread lock.

**removeFilter** (*filter*)

Remove the specified filter from this handler.

**setFormatter** (*fmt*)

Set the formatter for this handler.

**setLevel** (*level*)

Set the logging level of this handler. level must be an int or a str.

**set\_name** (*name*)

**uninstall** ()

Un-install this LogHandler from the Python logging framework for the named loggers.

This will re-instate any existing handlers for those loggers that were removed during installation and restore their level that prior to installation.

**uninstall\_all** ()

This will uninstall all existing LogHandler objects.

## Contents

- *Bloks*
  - *Blok anyblok-core*
    - \* *Sequence*
    - \* *Parameter*
    - \* *API doc*
  - *Blok IO*
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  - *Blok IO XML*
    - \* *Exporter*
    - \* *Importer*
    - \* *API doc*
  - *Blok Model Auth*
    - \* *API doc*

## 8.1 Blok anyblok-core

```
class anyblok.bloks.anyblok_core.AnyBlokCore(registry)
```

```
    Bases: anyblok.blok.Blok
```

This blok is required by all anyblok application. This blok define the main fonctionnality to install, update and uninstall blok. And also list the known models, fields, columns and relationships

```
    autoinstall = True
```

```
    conditional_by = []
```

```
    conflicting_by = []
```

```
    classmethod import_declaration_module()
```

```
    name = 'anyblok-core'
```

```
    optional_by = []
```

```
    pre_migration(latest_version)
```

```
    pre_migration_0_4_1_fields_become_polymorphic(latest_version)
```

```
    priority = 0
```

```
    classmethod reload_declaration_module(reload)
```

```
    required_by = ['anyblok-io']
```

```
    version = '0.9.3'
```

This blok is required by all anyblok application. This blok define the main fonctionnality to install, update and uninstall blok. And also list the known models, fields, columns and relationships:

- **Core Model**
  - Base: inherited by all the Model
  - SqlBase: Inherited only by the model with table
  - SqlViewBase: Inherited only by the sql view model
- **System Models**
  - Blok: List the bloks
  - Model: List the models

- Field: List of the fields
- Column: List of the columns
- Relationship: List of the relation ship
- Sequence: Define database sequence
- Parameter: Define application parameter

### 8.1.1 Sequence

Some behaviours need to have sequence:

```
sequence = registry.System.Sequence.insert(  
    code="string code",  
    formater="One prefix {seq} One suffix")
```

---

**Note:** It is a python formater, you can use the variable:

- seq: numero of the current data base sequence
- code: code field
- id: id field

---

Get the next value of the sequence:

```
sequence.nextval()
```

exemple:

```
seq = Sequence.insert(code='SO', formater="{code}-{seq:06d}")  
seq.nextval()  
>>> SO-000001  
seq.nextval()  
>>> SO-000002
```

### 8.1.2 Parameter

Parameter is a simple model key / value:

- key: must be a String
- value: any type

Add new value in the paramter model:

```
registry.System.Parameter.set(key, value)
```

---

**Note:** If the key already exist, then the value of the key is updated

---

Get an existing value:

```
registry.System.Parameter.get(key)
```

**Warning:** If the key does not exist then an `ExceptionParameter` will raise

Check the key exist:

```
registry.System.Parameter.is_exist(key) # return a Boolean
```

Return and remove the parameter:

```
registry.System.Parameter.pop(key)
```

### 8.1.3 API doc

#### Authorization

**class** `anyblok.bloks.anyblok_core.authorization.Authorization`

Bases: `object`

Namespace for models supporting authorization policies.

**class** `anyblok.bloks.anyblok_core.authorization.DefaultModelDeclaration`

Bases: `object`

Pseudo model to represent the default value.

#### Core

**class** `anyblok.bloks.anyblok_core.core.base.Base`

Bases: `object`

Inherited by all the models

**Declaration type** `Core`

**Registry name** `Core.Base`

**classmethod** `fire(event, *args, **kwargs)`

Call a specific event on the model

**Parameters** `event` – Name of the event

**classmethod** `from_primary_keys(*pks)`

No SQL Model has not primary key

**classmethod** `get_primary_keys(*pks)`

No SQL Model has not primary key

**classmethod** `has_model_perm(principals, permission)`

Check that one of principals has permission on given model.

Since this is a classmethod, even if called on a record, only its model class will be considered for the permission check.

**has\_perm** `(principals, permission)`

Check that one of principals has permission on given record.

Since this is an ordinary instance method, it can't be used on the model class itself. For this use case, see `has_model_perm()`

**classmethod** `initialize_model()`

This method is called to initialize a model during the creation of the registry

**to\_primary\_keys()**

No SQL Model has not primary key

**class** anyblok.bloks.anyblok\_core.core.sqlbase.**SqlMixin**

Bases: object

**classmethod** **aliased**(\*args, \*\*kwargs)

Facility to Apply an aliased on the model:

```
MyModelAliased = MyModel.aliased()
```

is equal at:

```
from sqlalchemy.orm import aliased
MyModelAliased = aliased(MyModel)
```

**Return type** SQLAlchemy aliased of the model

**classmethod** **from\_multi\_primary\_keys**(\*pks)

return the instances of the model from the primary keys

**Parameters** \*pks – list of dict [{primary\_key: value, ...}]

**Return type** instances of the model

**classmethod** **from\_primary\_keys**(\*\*pks)

return the instance of the model from the primary keys

**Parameters** \*\*pks – dict {primary\_key: value, ...}

**Return type** instance of the model

**classmethod** **get\_primary\_keys**()

return the name of the primary keys of the model

**Type** list of the primary keys name

**classmethod** **get\_where\_clause\_from\_primary\_keys**(\*\*pks)

return the where clause to find object from pks

**Parameters** \*\*pks – dict {primary\_key: value, ...}

**Return type** where clause

**Exception** SqlBaseException

**classmethod** **query**(\*elements)

Facility to do a SQLAlchemy query:

```
query = MyModel.query()
```

is equal at:

```
query = self.registry.session.query(MyModel)
```

**Parameters** **elements** – pass at the SQLAlchemy query, if the element is a string then that are see as field of the model

**Return type** SQLAlchemy Query

**to\_dict**(\*fields)

Transform a record to the dict of value

**Parameters fields** – list of fields to put in dict; if not selected, fields then take them all. A field is either one of these:

- a string (which is the name of the field)
- a 2-tuple if the field is a relationship (name of the field, tuple of foreign model fields)

**Return type** dict

Here are some examples:

```
=>> instance.to_dict() # get all fields
{"id": 1,
 "column1": "value 1",
 "column2": "value 2",
 "column3": "value 3",
 "relation1": {"relation_pk_1": 42, "relation_pk_2": "also 42"}
               # m2o or o2o : this is a dictionary
 "relation2": [{"id": 28}, {"id": 1}, {"id": 34}]
               # o2m or m2m : this is a list of dictionaries
}

=>> instance.to_dict("column1", "column2", "relation1")
      # get selected fields only (without any constraints)
{"column1": "value 1",
 "column2": "value 2",
 "relation1": {"relation_pk_1": 42, "relation_pk_2": "also 42"}
}

=>> instance.to_dict("column1", "column2", (
      # select fields to use in the relation related model
      "relation1", ("relation_pk1", "name", "value")
      # there is no constraints in the choice of fields
))
{"column1": "value",
 "column2": "value",
 "relation1": {"relation_pk_1": 42, "name": "H2G2", "value": "42"}
}

=>> instance.to_dict("column1", "column2", ("relation1", ))
# or
=>> instance.to_dict("column1", "column2", ("relation1", None))
# or
=>> instance.to_dict("column1", "column2", ("relation1", ()))
      # select all the fields of the relation ship
{"column1": "value",
 "column2": "value",
 "relation1": {"relation_pk_1": 42, "name": "H2G2", "value": "42"}
}

=>> instance.to_dict("column1", "column2", (
      # select relation fields recursively
      "relation1", ("name", "value", (
          "relation", ("a", "b", "c")
      ))
))
{"column1": "value",
 "column2": "value",
 "relation1": {"name": "H2G2", "value": "42", "relation": [
    {"a": 10, "b": 20, "c": 30},
```

```
        {"a": 11, "b": 22, "c": 33},
    ]}
}
```

**to\_primary\_keys()**  
return the primary keys and values for this instance

**Return type** dict {primary key: value, ...}

**class** anyblok.bloks.anyblok\_core.core.sqlbase.**SqlBase**  
Bases: anyblok.bloks.anyblok\_core.core.sqlbase.SqlMixin

this class is inherited by all the SQL model

**Declaration type** Core

**Registry name** Core.SqlBase

**delete** (*flush=True*)  
Call the SQLAlchemy Query.delete method on the instance of the model:

```
self.delete()
```

is equal at:

```
flush the session
remove the instance of the session
and expire all the session, to reload the relation ship
```

**expire** (*\*fields*)  
Expire the attribute of the instance, theses attributes will be load at the next call of the instance  
see: [http://docs.sqlalchemy.org/en/latest/orm/session\\_api.html](http://docs.sqlalchemy.org/en/latest/orm/session_api.html) #sqlalchemy.orm.session.Session.expire

**expire\_relationship\_mapped** (*mappers*)  
Expire the objects linked with this object, in function of the mappers definition

**find\_relationship** (*\*fields*)  
Find column and relation ship link with the column or relationship passed in fields.

**Parameters** *\*fields* – lists of the attribute name

**Return type** list of the attribute name of the attribute and relation ship

**Cached classmethod** with size=128

**classmethod insert** (*\*\*kwargs*)  
Insert in the table of the model:

```
MyModel.insert(...)
```

is equal at:

```
mymodel = MyModel(...)
MyModel.registry.session.add(mymodel)
MyModel.registry.flush()
```

**classmethod multi\_insert** (*\*args*)  
Insert in the table one or more entry of the model:

```
MyModel.multi_insert([ {...}, ...])
```

the flush will be done only one time at the end of the insert



**Exception** `SqlBaseException`

**classmethod** `precommit_hook` (*method*, \*args, \*\*kwargs)

Same in the registry a hook to call just before the commit

**Warning:** Only one instance of the hook is called before the commit

**Parameters**

- **method** – the method to call on this model
- **put\_at\_the\_end\_if\_exist** – If `True` the hook is move at the end

**refresh** (\*fields)

Expire and reload all the attribute of the instance

See: [http://docs.sqlalchemy.org/en/latest/orm/session\\_api.html](http://docs.sqlalchemy.org/en/latest/orm/session_api.html) #sqlalchemy.orm.session.Session.refresh

**update** (\*\*values)

Hight level method to update the session for the instance

```
self.update(val1=.., val2= ...)
```

..warning:

the columns and values is passed as named arguments to show a difference with `Query.update` meth

**class** `anyblok.bloks.anyblok_core.core.sqlviewbase.SqlViewBase`

Bases: `anyblok.bloks.anyblok_core.core.sqlbase.SqlMixin`

this class is inherited by all the SQL view

**Declaration type** `Core`

**Registry name** `Core.SqlViewBase`

**class** `anyblok.bloks.anyblok_core.core.instrumentedlist.InstrumentedList`

Bases: `object`

class of the return of the `query.all()` or the relationship list

**Declaration type** `Core`

**Registry name** `Core.InstrumentedList`

**class** `anyblok.bloks.anyblok_core.core.query.Query` (*entities*, *session=None*)

Bases: `sqlalchemy.orm.query.Query`

Overload the `SqlAlchemy Query`

**Declaration type** `Core`

**Registry name** `Core.Query`

**all** ()

Return an instrumented list of the result of the query

**with\_perm** (*principals*, *permission*)

Add authorization pre- and post-filtering to query.

This must be last in the construction chain of the query. Queries too complicated for the authorization system to infer safely will be refused.

**Parameters**

- **principals** – list, set or tuple of strings
- **permission** (*str*) – the permission to filter for

**Returns** a query-like object, with only the returning methods, such as `all()`, `count()` etc. available.

**class** `anyblok.bloks.anyblok_core.core.session.Session(*args, **kwargs)`

Bases: `sqlalchemy.orm.session.Session`

Overload of the SQLAlchemy session

**Declaration type** `Core`

**Registry name** `Core.Session`

**system**

**class** `anyblok.bloks.anyblok_core.system.System`

Bases: `object`

**Declaration type** `Model`

**Tablename** `system`

**Registry name** `Model.System`

**Inherit model or mixin**

**class** `anyblok.bloks.anyblok_core.system.blok.Blok`

Bases: `object`

**Declaration type** `Model`

**Tablename** `system_blok`

**Registry name** `Model.System.Blok`

**Inherit model or mixin**

field name	Description
name	<ul style="list-style-type: none"> <li>•Context:</li> <li>•foreign_key - None</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•nullable - False</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•primary_key - True</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> <li>•is crypted - False</li> </ul>
state	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.Selection'&gt;</li> <li>•nullable - False</li> <li>•selections:</li> <li>•touninstall - To uninstall</li> <li>•installed - Installed</li> <li>•uninstalled - Uninstalled</li> <li>•undefined - Undefined</li> <li>•toinstall - To install</li> <li>•toupdate - To update</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - uninstalled</li> <li>•Label - None</li> </ul>
long_description	<ul style="list-style-type: none"> <li>•Context:</li> <li>•fget - get_long_description</li> <li>•Field type - &lt;class 'any-blok.field.Function'&gt;</li> <li>•Label - None</li> </ul>
version	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•nullable - False</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>
order	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.Integer'&gt;</li> </ul>

**classmethod** `apply_state (*bloks)`

Call the right method if the blok state change

**Warning:** for the uninstallation the method called is `uninstall_all`

**Parameters** `bloks` – list of the blok name load by the registry

**classmethod** `check_if_the_conditional_are_installed (blok)`

Return True if all the conditions to install the blok are satisfied

**Parameters** `blok` – blok name

**Return type** boolean

**get\_long\_description ()**

fgget of the `long_description` Column.Selection

**Return type** the readme file of the blok

**get\_short\_description ()**

fgget of the `short_description` Column.Selection

**Return type** the docstring of the blok

**install ()**

Method to install the blok

**classmethod** `list_by_state (*states)`

Return the blok name in function of the wanted states

**Parameters** `states` – list of the state

**Return type** list if state is a state, dict if the states is a list

**load ()**

Method to load the blok when the registry is completely loaded

**classmethod** `load_all ()`

Load all the installed bloks

**uninstall ()**

Method to uninstall the blok

**classmethod** `uninstall_all (*bloksname)`

Search and call the uninstall method for all the uninstalled bloks

**Warning:** Use the `desc` order to uninstall because we can't uninstall a dependencies before

**Parameters** `bloksname` – list of the blok name to uninstall

**classmethod** `update_list ()`

Populate the bloks list and update the state of existing bloks

**upgrade ()**

Method to update the blok

**class** `anyblok.bloks.anyblok_core.system.cache.Cache`

Bases: `object`

**Declaration type** `Model`

**Tablename** `system_cache`

**Registry name** `Model.System.Cache`

**Inherit model or mixin**

field name	Description
id	<ul style="list-style-type: none"> <li>•Context:</li> <li>•foreign_key - None</li> <li>•autoincrement - True</li> <li>•Field type - &lt;class 'any-blok.column.Integer'&gt;</li> <li>•DB column name - None</li> <li>•primary_key - True</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> <li>•is crypted - False</li> </ul>
registry_name	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•nullable - False</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>
method	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•nullable - False</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>

**classmethod clear\_invalidate\_cache()**

Invalidate the cache that needs to be invalidated

**classmethod detect\_invalidation()**

Return True if a new invalidation is found in the table

**Return type** Boolean

**classmethod get\_invalidation()**

Return the pointer of the method to invalidate

**classmethod get\_last\_id()**

Return the last primary key id value

**classmethod initialize\_model()**

Initialize the last\_cache\_id known

**classmethod invalidate** (*registry\_name, method*)

Call the invalidation for a specific method cached on a model

**Parameters**

- **registry\_name** – namespace of the model
- **method** – name of the method on the model

**Exception** CacheException

**class** anyblok.bloks.anyblok\_core.system.field.**Field**

Bases: object

**Declaration type** Model

**Tablename** system\_field

**Registry name** Model.System.Field

**Inherit model or mixin**

field name	Description
name	<ul style="list-style-type: none"> <li>•Context:</li> <li>•primary_key - True</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> <li>•is crypted - False</li> </ul>
entity_type	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•nullable - True</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>
model	<ul style="list-style-type: none"> <li>•Context:</li> <li>•primary_key - True</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> <li>•is crypted - False</li> </ul>
code	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•nullable - True</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>
ftype	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•nullable - True</li> <li>•size - 64</li> </ul>
8.1. Blok anyblok-core	<ul style="list-style-type: none"> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•nullable - True</li> <li>•size - 64</li> </ul>

**classmethod** `add_field` (*rname, label, model, table, ftype*)

Insert a field definition

**Parameters**

- **rname** – name of the field
- **label** – label of the field
- **model** – namespace of the model
- **table** – name of the table of the model
- **ftype** – type of the AnyBlok Field

**classmethod** `alter_field` (*field, label, ftype*)

Update an existing field

**Parameters**

- **field** – instance of the Field model to update
- **label** – label of the field
- **ftype** – type of the AnyBlok Field

**class** `anyblok.bloks.anyblok_core.system.column.Column`

Bases: `anyblok.model.Field`

**Declaration type** Model

**Tablename** `system_column`

**Registry name** `Model.System.Column`

**Inherit model or mixin**

- `<class 'anyblok.model.Field'>`



field name	Description
name	<ul style="list-style-type: none"> <li>•Context:</li> <li>•primary_key - True</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> <li>•is crypted - False</li> </ul>
foreign_key	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>
model	<ul style="list-style-type: none"> <li>•Context:</li> <li>•primary_key - True</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> <li>•is crypted - False</li> </ul>
nullable	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.Boolean'&gt;</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>
unique	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.Boolean'&gt;</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>
<b>8.1. Blok anyblok-core</b>	<ul style="list-style-type: none"> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>

**classmethod** `add_field` (*cname, column, model, table, ftype*)

Insert a column definition

**Parameters**

- **cname** – name of the column
- **column** – instance of the column
- **model** – namespace of the model
- **table** – name of the table of the model
- **ftype** – type of the AnyBlok Field

**classmethod** `alter_field` (*column, meta\_column, ftype*)

Update an existing column

**Parameters**

- **column** – instance of the Column model to update
- **meta\_column** – instance of the SQLAlchemy column
- **ftype** – type of the AnyBlok Field

**classmethod** `get_cname` (*field, cname*)

Return the real name of the column

**Parameters**

- **field** – the instance of the column
- **cname** – Not use here

**Return type** string of the real column name

**class** `anyblok.bloks.anyblok_core.system.relationship.Relationship`

Bases: `anyblok.model.Field`

**Declaration type** Model

**Tablename** `system_relationship`

**Registry name** `Model.System.Relationship`

**Inherit model or mixin**

- `<class 'anyblok.model.Field'>`

field name	Description
name	<ul style="list-style-type: none"> <li>•Context:</li> <li>•primary_key - True</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> <li>•is crypted - False</li> </ul>
remote_name	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>
remote	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.Boolean'&gt;</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - False</li> <li>•Label - None</li> </ul>
model	<ul style="list-style-type: none"> <li>•Context:</li> <li>•primary_key - True</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> <li>•is crypted - False</li> </ul>
nullable	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.Boolean'&gt;</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>
8.1. Blok anyblok-core	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>

**classmethod** `add_field` (*rname, relation, model, table, ftype*)

Insert a relationship definition

**Parameters**

- **rname** – name of the relationship
- **relation** – instance of the relationship
- **model** – namespace of the model
- **table** – name of the table of the model
- **ftype** – type of the AnyBlok Field

**class** `anyblok.bloks.anyblok_core.system.cron.Cron`

Bases: `object`

**Declaration type** `Model`

**Tablename** `system_cron`

**Registry name** `Model.System.Cron`

**Inherit model or mixin**

**class** `anyblok.bloks.anyblok_core.system.cron.Job`

Bases: `object`

**Declaration type** `Model`

**Tablename** `system_cron_job`

**Registry name** `Model.System.Cron.Job`

**Inherit model or mixin**

field name	Description
id	<ul style="list-style-type: none"> <li>•Context:</li> <li>•foreign_key - None</li> <li>•autoincrement - True</li> <li>•Field type - &lt;class 'any-blok.column.Integer'&gt;</li> <li>•DB column name - None</li> <li>•primary_key - True</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> <li>•is crypted - False</li> </ul>
available_at	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.DateTime'&gt;</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>
done_at	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.DateTime'&gt;</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>
params	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.Json'&gt;</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>
method	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•nullable - False</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>
8.1. Blok anyblok-core	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•nullable - False</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>

**class** anyblok.bloks.anyblok\_core.system.cron.**Worker** (*job*)

Bases: threading.Thread

**Declaration type** Model

**Tablename** system\_cron\_worker

**Registry name** Model.System.Cron.Worker

**Inherit model or mixin**

**class** anyblok.bloks.anyblok\_core.system.model.**Model**

Bases: object

Models assembled

**Declaration type** Model

**Tablename** system\_model

**Registry name** Model.System.Model

**Inherit model or mixin**

field name	Description
name	<ul style="list-style-type: none"> <li>•Context:</li> <li>•primary_key - True</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•size - 256</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> <li>•is crypted - False</li> </ul>
is_sql_model	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.Boolean'&gt;</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - Is a SQL model</li> </ul>
table	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•size - 256</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>
description	<ul style="list-style-type: none"> <li>•Context:</li> <li>•fget - get_model_doc_string</li> <li>•Field type - &lt;class 'any-blok.field.Function'&gt;</li> <li>•Label - None</li> </ul>

**get\_model\_doc\_string()**

Return the docstring of the model

**classmethod update\_list()**

Insert and update the table of models

**Exception** Exception

**class** anyblok.bloks.anyblok\_core.system.parameter.**Parameter**

Bases: object

## System Parameter

**Declaration type** Model**Tablename** system\_parameter**Registry name** Model.System.Parameter**Inherit model or mixin**

field name	Description
value	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.Json'&gt;</li> <li>•nullable - False</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>
multi	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.Boolean'&gt;</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - False</li> <li>•Label - None</li> </ul>
key	<ul style="list-style-type: none"> <li>•Context:</li> <li>•primary_key - True</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> <li>•is crypted - False</li> </ul>

**classmethod** `get (key)`

Return the value of the key

**Parameters** `key` – key to check**Return type** return value**Exception** ExceptionParameter**classmethod** `is_exist (key)`

Check if one parameter exist for the key



**Parameters** **key** – key to check

**Return type** Boolean, True if exist

**classmethod** **pop** (*key*)

Remove return the value of the key

**Parameters** **key** – key to check

**Return type** return value

**Exception** ExceptionParameter

**classmethod** **set** (*key, value*)

Insert or Update parameter for the key

**Parameters**

- **key** – key to save
- **value** – value to save

**class** `anyblok.bloks.anyblok_core.system.sequence.Sequence`

Bases: `object`

System sequence

**Declaration type** `Model`

**Tablename** `system_sequence`

**Registry name** `Model.System.Sequence`

**Inherit model or mixin**

field name	Description
id	<ul style="list-style-type: none"> <li>•Context:</li> <li>•foreign_key - None</li> <li>•autoincrement - True</li> <li>•Field type - &lt;class 'any-blok.column.Integer'&gt;</li> <li>•DB column name - None</li> <li>•primary_key - True</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> <li>•is crypted - False</li> </ul>
seq_name	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•nullable - False</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>
formater	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•nullable - False</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - {seq}</li> <li>•Label - None</li> </ul>
code	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•nullable - False</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>
number	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.Integer'&gt;</li> <li>•nullable - False</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> </ul>

```

classmethod create_sequence (values)
    create the sequence for one instance

classmethod initialize_model ()
    Create the sequence to determine name

classmethod insert (**kwargs)
    Overwrite insert

classmethod multi_insert (*args)
    Overwrite multi_insert

nextval ()
    return the next value of the sequence

classmethod nextvalBy (**kwargs)
    Get the first sequence filtering by entries and return the next value

```

#### documentation

```

class anyblok.bloks.anyblok_core.documentation.DocElement
    Bases: object

```

**Declaration type** Mixin

**Inherit model or mixin**

```

class anyblok.bloks.anyblok_core.documentation.Documentation
    Bases: anyblok.mixin.DocElement

```

**Declaration type** Model

**Tablename** documentation

**Registry name** Model.Documentation

**Inherit model or mixin**

- <class 'anyblok.mixin.DocElement'>

```

class anyblok.bloks.anyblok_core.documentation.blok.Blok (blok)
    Bases: object

```

**Declaration type** Model

**Tablename** documentation\_blok

**Registry name** Model.Documentation.Blok

**Inherit model or mixin**

```

class anyblok.bloks.anyblok_core.documentation.model.Model (model)
    Bases: anyblok.mixin.DocElement

```

**Declaration type** Model

**Tablename** documentation\_model

**Registry name** Model.Documentation.Model

**Inherit model or mixin**

- <class 'anyblok.mixin.DocElement'>

```

class anyblok.bloks.anyblok_core.documentation.model.attribute.Attribute (attribute)
    Bases: object

```

**Declaration type** Model

**Tablename** documentation\_model\_attribute

**Registry name** Model.Documentation.Model.Attribute

**Inherit model or mixin**

**class** anyblok.bloks.anyblok\_core.documentation.model.field.**Field** (*field*)

Bases: object

**Declaration type** Model

**Tablename** documentation\_model\_field

**Registry name** Model.Documentation.Model.Field

**Inherit model or mixin**

**exception**

**exception** anyblok.bloks.anyblok\_core.exceptions.**CoreBaseException**

Bases: TypeError

Exception for Core.Base

**exception** anyblok.bloks.anyblok\_core.exceptions.**SqlBaseException**

Bases: Exception

Simple Exception for sql base

**exception** anyblok.bloks.anyblok\_core.exceptions.**QueryException**

Bases: Exception

Simple Exception for query

**exception** anyblok.bloks.anyblok\_core.exceptions.**CacheException**

Bases: Exception

Simple Exception for the cache Model

**exception** anyblok.bloks.anyblok\_core.exceptions.**ParameterException**

Bases: Exception

Simple exception for System.Parameter

**exception** anyblok.bloks.anyblok\_core.exceptions.**CronWorkerException**

Bases: Exception

Simple exception for System.Parameter

## 8.2 Blok IO

**class** anyblok.bloks.io.**AnyBlokIO** (*registry*)

Bases: anyblok.blok.Blok

In / Out tool's:

- Formater: convert value 2 str or str 2 value in function of the field,
- Importer: main model to define an import,
- Exporter: main model to define an export,

**conditional\_by** = []

**conflicting\_by** = []

```

classmethod declare_io()
classmethod import_declaration_module()
name = 'anyblok-io'
optional_by = []
classmethod reload_declaration_module(reload)
required = ['anyblok-core']
required_by = ['anyblok-io-csv', 'anyblok-io-xml']
version = '0.9.3'

```

---

**Note:** Require the anyblok-io blok

---

### 8.2.1 Mapping

`Model.IO.Mapping` allows to link a `Model` instance by a `Model` namespace and str key. this key is an external *ID*

Save an instance with a key:

```

Blok = self.registry.System.Blok
blok = Blok.query().filter(Blok.name == 'anyblok-core').first()
self.registry.IO.Mapping.set('External ID', blok)

```

**Warning:** By default if you save another instance with the same key and the same model, an `IOMappingSetException` will be raised. If really you want this mapping you must call the set method with the named argument **raiseifexist=False**:

```

self.registry.IO.Mapping.set('External ID', blok, raiseifexist=False)

```

Get an entry in the mapping:

```

blok2 = self.registry.IO.Mapping.get('Model.System.Blok', 'External ID')
assert blok2 is blok

```

### 8.2.2 Formater

The goal of the formater is to get:

- value from string
- value from mapping key
- string from value
- mapping key from value

The value is the value of the field.

**Warning:** The relationships are particular cases. The value is the json of the primary keys. The `Many2Many` and the `One2Many` are the json of the list of the primary keys

### 8.2.3 Exporter

The `Model.IO.Exporter` export some entries in fonction of configuration. `anyblok-io` blok doesn't give complete exporter, just the base Model to standardize all the possible export:

```
exporter = registry.IO.Exporter.insert(...) # create a exporter
entries = ... # entries are instance of model
fp = exporter.run(entries)
# fp is un handler on the opened file (StringIO)
```

### 8.2.4 Importer

The `Model.IO.Importer` import some entries in fonction of configuration. `anyblok-io` blok doesn't give complete importer, just the base Model to standardize all the possible import:

```
importer = registry.IO.Importer.insert(...) # create an importer
# the file to import are filled in the parameter
entries = importer.run()
```

### 8.2.5 API doc

#### exceptions

**exception** `anyblok.bloks.io.exceptions.IOException`

Bases: `Exception`

IO exception

**exception** `anyblok.bloks.io.exceptions.IOMappingCheckException`

Bases: `anyblok.bloks.io.exceptions.IOException`

IO Exception for setter

**exception** `anyblok.bloks.io.exceptions.IOMappingSetException`

Bases: `anyblok.bloks.io.exceptions.IOException`

IO Exception for setter

**exception** `anyblok.bloks.io.exceptions.ImporterException`

Bases: `Exception`

Simple Exception for importer

**exception** `anyblok.bloks.io.exceptions.ExporterException`

Bases: `Exception`

Simple Exception for exporter

**exception** `anyblok.bloks.io.exceptions.FormatterException`

Bases: `Exception`

Simple Exception for importer

#### mapping

**class** `anyblok.bloks.io.mapping.Mapping`

Bases: `object`

**Declaration type** `Model`

**Tablename** `io_mapping`

**Registry name** Model.IO.Mapping

**Inherit model or mixin**

field name	Description
primary_key	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.Json'&gt;</li> <li>•nullable - False</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>
model	<ul style="list-style-type: none"> <li>•Context:</li> <li>•primary_key - True</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - Model.System.Model =&gt; name</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> <li>•is crypted - False</li> </ul>
key	<ul style="list-style-type: none"> <li>•Context:</li> <li>•primary_key - True</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> <li>•is crypted - False</li> </ul>

**classmethod** `check_primary_keys(model, *pks)`

check if the all the primary keys match with primary keys of the model

#### Parameters

- **model** – model to check
- **pks** – list of the primary keys to check

**Exception** IOMappingCheckException

**classmethod** `delete(model, key, mapping_only=True)`

Delete the key for this model

**Parameters**

- **model** – model of the mapping
- **key** – string of the key

**Return type** Boolean True if the mapping is removed

**filter\_by\_model\_and\_key** (*model, key*)

SQLAlchemy hybrid method to filter by model and key

**Parameters**

- **model** – model of the mapping
- **key** – external key of the mapping

**Hybrid method**

**filter\_by\_model\_and\_keys** (*model, \*keys*)

SQLAlchemy hybrid method to filter by model and key

**Parameters**

- **model** – model of the mapping
- **key** – external key of the mapping

**Hybrid method**

**classmethod get** (*model, key*)

return instance of the model with this external key

**Parameters**

- **model** – model of the mapping
- **key** – string of the key

**Return type** instance of the model

**classmethod get\_mapping\_primary\_keys** (*model, key*)

return primary key for a model and an external key

**Parameters**

- **model** – model of the mapping
- **key** – string of the key

**Return type** dict primary key: value or None

**classmethod multi\_delete** (*model, \*keys, \*\*kwargs*)

Delete all the keys for this model

**Parameters**

- **model** – model of the mapping
- **\*keys** – list of the key

**Return type** Boolean True if the mappings are removed

**classmethod set** (*key, instance, raiseifexist=True*)

Add or update a mmping with a model and a external key

**Parameters**

- **model** – model to check



- **key** – string of the key
- **instance** – instance of the model to save
- **raiseifexist** – boolean (True by default), if True and the entry exist then an exception is raised

**Exception** IOMappingSetException

**classmethod** **set\_primary\_keys** (*model, key, pks, raiseifexist=True*)

Add or update a mmping with a model and a external key

**Parameters**

- **model** – model to check
- **key** – string of the key
- **pks** – dict of the primary key to save
- **raiseifexist** – boolean (True by default), if True and the entry exist then an exception is raised

**Exception** IOMappingSetException

**mixin**

**class** `anyblok.bloks.io.mixin.IOMixin`

Bases: `object`

**Declaration type** Mixin

**Inherit model or mixin**

field name	Description
id	<ul style="list-style-type: none"> <li>•Context:</li> <li>•foreign_key - None</li> <li>•autoincrement - True</li> <li>•Field type - &lt;class 'any-blok.column.Integer'&gt;</li> <li>•DB column name - None</li> <li>•primary_key - True</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> <li>•is crypted - False</li> </ul>
mode	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.Selection'&gt;</li> <li>•nullable - False</li> <li>•selections - get_mode_choices</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>
model	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•nullable - False</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - Model.System.Model =&gt; name</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>

**importer**

**class** anyblok.bloks.io.importer.**Importer**

Bases: anyblok.mixin.IOMixin

**Declaration type** Model

**Tablename** io\_importer

**Registry name** Model.IO.Importer

**Inherit model or mixin**

- <class 'anyblok.mixin.IOMixin'>

field name	Description
check_import	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class</li> </ul> <p><b>‘anyblok.column.Boolean’&gt;</b></p> <ul style="list-style-type: none"> <li>• DB column name - None</li> <li>• foreign_key - None</li> <li>• default - False</li> <li>• Label - None</li> </ul>
file_to_import	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class</li> </ul> <p><b>‘anyblok.column.LargeBinary’&gt;</b></p> <ul style="list-style-type: none"> <li>• nullable - False</li> <li>• DB column name - None</li> <li>• foreign_key - None</li> <li>• default - &lt;class</li> </ul> <p><b>‘anyblok.column.NoDefaultValue’&gt;</b></p> <ul style="list-style-type: none"> <li>• Label - None</li> </ul>
offset	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class</li> </ul> <p><b>‘anyblok.column.Integer’&gt;</b></p> <ul style="list-style-type: none"> <li>• DB column name - None</li> <li>• foreign_key - None</li> <li>• default - 0</li> <li>• Label - None</li> </ul>
nb_grouped_lines	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class</li> </ul> <p><b>‘anyblok.column.Integer’&gt;</b></p> <ul style="list-style-type: none"> <li>• nullable - False</li> <li>• DB column name - None</li> <li>• foreign_key - None</li> <li>• default - 50</li> <li>• Label - None</li> </ul>
commit_at_each_grouped	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class</li> </ul> <p><b>‘anyblok.column.Boolean’&gt;</b></p> <ul style="list-style-type: none"> <li>• DB column name - None</li> <li>• foreign_key - None</li> <li>• default - True</li> <li>• Label - None</li> </ul>

**exporter**

**class** `anyblok.bloks.io.exporter.Exporter`  
Bases: `anyblok.mixin.IOMixin`

**Declaration type** `Model`

**Tablename** `io_exporter`

**Registry name** `Model.IO.Exporter`

**Inherit model or mixin**

- `<class 'anyblok.mixin.IOMixin'>`

**formater**

**class** `anyblok.bloks.io.formater.Formatter`  
Bases: `object`

**Declaration type** `Model`

**Tablename** `io_formater`

**Registry name** `Model.IO.Formatter`

**Inherit model or mixin**

**class** `anyblok.bloks.io.formater.Float`  
Bases: `anyblok.model.Formatter`

**Declaration type** `Model`

**Tablename** `io_formater_float`

**Registry name** `Model.IO.Formatter.Float`

**Inherit model or mixin**

- `<class 'anyblok.model.Formatter'>`

**class** `anyblok.bloks.io.formater.Decimal`  
Bases: `anyblok.model.Formatter`

**Declaration type** `Model`

**Tablename** `io_formater_decimal`

**Registry name** `Model.IO.Formatter.Decimal`

**Inherit model or mixin**

- `<class 'anyblok.model.Formatter'>`

**class** `anyblok.bloks.io.formater.Json`  
Bases: `anyblok.model.Formatter`

**Declaration type** `Model`

**Tablename** `io_formater_json`

**Registry name** `Model.IO.Formatter.Json`

**Inherit model or mixin**

- `<class 'anyblok.model.Formatter'>`

**class** `anyblok.bloks.io.formater.Interval`  
Bases: `anyblok.model.Formatter`

**Declaration type** Model

**Tablename** io\_formatter\_interval

**Registry name** Model.IO.Formatter.Interval

**Inherit model or mixin**

- <class 'anyblok.model.Formatter'>

**class** anyblok.bloks.io.formatter.**Integer**

Bases: anyblok.model.Formatter

**Declaration type** Model

**Tablename** io\_formatter\_integer

**Registry name** Model.IO.Formatter.Integer

**Inherit model or mixin**

- <class 'anyblok.model.Formatter'>

**class** anyblok.bloks.io.formatter.**SmallInteger**

Bases: anyblok.model.Integer

**Declaration type** Model

**Tablename** io\_formatter\_smallinteger

**Registry name** Model.IO.Formatter.SmallInteger

**Inherit model or mixin**

- <class 'anyblok.model.Integer'>

**class** anyblok.bloks.io.formatter.**BigInteger**

Bases: anyblok.model.Integer

**Declaration type** Model

**Tablename** io\_formatter\_biginteger

**Registry name** Model.IO.Formatter.BigInteger

**Inherit model or mixin**

- <class 'anyblok.model.Integer'>

**class** anyblok.bloks.io.formatter.**Boolean**

Bases: anyblok.model.Formatter

**Declaration type** Model

**Tablename** io\_formatter\_boolean

**Registry name** Model.IO.Formatter.Boolean

**Inherit model or mixin**

- <class 'anyblok.model.Formatter'>

**class** anyblok.bloks.io.formatter.**Time**

Bases: anyblok.model.Formatter

**Declaration type** Model

**Tablename** io\_formatter\_time

**Registry name** Model.IO.Formatter.Time

**Inherit model or mixin**

- <class 'anyblok.model.Formatter'>

**class** anyblok.bloks.io.formater.**Date**

Bases: anyblok.model.Formatter

**Declaration type** Model**Tablename** io\_formater\_date**Registry name** Model.IO.Formatter.Date**Inherit model or mixin**

- <class 'anyblok.model.Formatter'>

**class** anyblok.bloks.io.formater.**DateTime**

Bases: anyblok.model.Formatter

**Declaration type** Model**Tablename** io\_formater\_datetime**Registry name** Model.IO.Formatter.DateTime**Inherit model or mixin**

- <class 'anyblok.model.Formatter'>

**class** anyblok.bloks.io.formater.**Many2One**

Bases: anyblok.model.Formatter

**Declaration type** Model**Tablename** io\_formater\_many2one**Registry name** Model.IO.Formatter.Many2One**Inherit model or mixin**

- <class 'anyblok.model.Formatter'>

**class** anyblok.bloks.io.formater.**One2One**

Bases: anyblok.model.Many2One

**Declaration type** Model**Tablename** io\_formater\_one2one**Registry name** Model.IO.Formatter.One2One**Inherit model or mixin**

- <class 'anyblok.model.Many2One'>

**class** anyblok.bloks.io.formater.**Many2Many**

Bases: anyblok.model.Formatter

**Declaration type** Model**Tablename** io\_formater\_many2many**Registry name** Model.IO.Formatter.Many2Many**Inherit model or mixin**

- <class 'anyblok.model.Formatter'>

```
class anyblok.bloks.io.formater.One2Many
    Bases: anyblok.model.Many2Many

    Declaration type Model
    Tablename io_formater_one2many
    Registry name Model.IO.Formatter.One2Many
    Inherit model or mixin
        • <class 'anyblok.model.Many2Many'>
```

## 8.3 Blok IO CSV

```
class anyblok.bloks.io_csv.AnyBlokIOCSV(registry)
    Bases: anyblok.blok.Blok

    CSV Importer / Exporter behaviour

    conditional_by = []
    conflicting_by = []
    classmethod import_declaration_module()
    name = 'anyblok-io-csv'
    optional_by = []
    classmethod reload_declaration_module(reload)
    required = ['anyblok-io']
    required_by = []
    version = '0.9.3'
```

---

**Note:** Require the anyblok-io-csv blok

---

### 8.3.1 Exporter

Add an exporter mode (CSV) in AnyBlok:

```
Exporter = registry.IO.Exporter.CSV
```

Define what export:

```
csv_delimiter = ','
csv_quotechar = '"'
model = ``Existing model name``
fields = [
    {'name': 'field name'},
    {'name': 'fieldname1.fieldname2. ... .fieldnamen} # fieldname1, fieldname 2 must be Many2One or
    {'name': 'field', model="external_id"} # field must be Many2One or foreign_keys or primary keys
    ...
]
```

Create the Exporter:

```
exporter = Exporter.insert(csv_delimiter=csv_delimiter,
                           csv_quotechar=csv_quotechar,
                           model=model,
                           fields=fields)
```

**Warning:** You can also make insert with `registry.IO.Exporter` directly

Run the export:

```
fp = exporter.run(entries) # entries are instance of the ``model``
```

### 8.3.2 Importer

Add an importer mode (CSV) in AnyBlok:

```
Importer = registry.IO.Importer.CSV
```

Define what import:

```
csv_delimiter = ','
csv_quotechar = '"'
model = ``Existing model name``
with open(..., 'rb') as fp:
    file_to_import = fp.read()
```

Create the Exporter:

```
importer = Importer.insert(csv_delimiter=csv_delimiter,
                           csv_quotechar=csv_quotechar,
                           model=model,
                           file_to_import=file_to_import)
```

**Warning:** You can also make insert with `registry.IO.Importer` directly

Run the import:

```
res = importer.run()
```

The result is a dict with:

- `error_found`: List the error, durring the import
- `created_entries`: Entries created by the import
- `updated_entries`: Entries updated by the import

List of the options for the import:

- **csv\_on\_error:**
  - `raise_now`: Raise now
  - `raise_at_the_end` (default): Raise at the end
  - `ignore`: Ignore and continue
- **csv\_if\_exist:**
  - `pass`: Pass to the next record



- overwrite (default): Update the record
  - create: Create another record
  - raise: Raise an exception
- **csv\_if\_does\_not\_exist:**
  - pass: Pass to the next record
  - create (default): Create another record
  - raise: Raise an exception

### 8.3.3 API doc

#### exceptions

**exception** `anyblok.bloks.io_csv.exceptions.CSVImporterException`

Bases: `anyblok.bloks.io.exceptions.ImporterException`

Simple exception for CSV importer

**exception** `anyblok.bloks.io_csv.exceptions.CSVExporterException`

Bases: `anyblok.bloks.io.exceptions.ExporterException`

Simple exception for CSV exporter

#### mixin

**class** `anyblok.bloks.io_csv.mixin.IOCSVFieldMixin`

Bases: `object`

**Declaration type** Mixin

**Inherit model or mixin**

field name	Description
id	<ul style="list-style-type: none"><li>•Context:</li><li>•foreign_key - None</li><li>•autoincrement - True</li><li>•Field type - &lt;class 'any-blok.column.Integer'&gt;</li><li>•DB column name - None</li><li>•primary_key - True</li><li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li><li>•Label - None</li><li>•is crypted - False</li></ul>
name	<ul style="list-style-type: none"><li>•Context:</li><li>•is crypted - False</li><li>•Field type - &lt;class 'any-blok.column.String'&gt;</li><li>•nullable - False</li><li>•size - 64</li><li>•DB column name - None</li><li>•foreign_key - None</li><li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li><li>•Label - None</li></ul>

**class** anyblok.bloks.io\_csv.mixin.**IOCSVMixin**

Bases: object

**Declaration type** Mixin

**Inherit model or mixin**

field name	Description
csv_quotechar	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•nullable - False</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - "</li> <li>•Label - None</li> </ul>
csv_delimiter	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•nullable - False</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - ,</li> <li>•Label - None</li> </ul>

**importer**

**class** anyblok.bloks.io\_csv.importer.**Importer**

Bases: anyblok.mixin.IOCSVMixin

**Declaration type** Model

**Tablename** io\_importer

**Registry name** Model.IO.Importer

**Inherit model or mixin**

- <class 'anyblok.mixin.IOCSVMixin'>

field name	Description
csv_on_error	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class</li> </ul> <p><b>‘anyblok.column.Selection’&gt;</b></p> <ul style="list-style-type: none"> <li>• selections:</li> <li>• (‘raise_now’, ‘Raise now’)</li> <li>• (‘raise_at_the_end’, ‘Raise at the end’)</li> <li>• (‘ignore’, ‘Ignore and continue’)</li> <li>• size - 64</li> <li>• DB column name - None</li> <li>• foreign_key - None</li> <li>• default - raise_at_the_end</li> <li>• Label - None</li> </ul>
csv_if_does_not_exist	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class</li> </ul> <p><b>‘anyblok.column.Selection’&gt;</b></p> <ul style="list-style-type: none"> <li>• selections:</li> <li>• (‘pass’, ‘Pass to the next record’)</li> <li>• (‘create’, ‘Create the record’)</li> <li>• (‘raise’, ‘Raise an exception’)</li> <li>• size - 64</li> <li>• DB column name - None</li> <li>• foreign_key - None</li> <li>• default - create</li> <li>• Label - None</li> </ul>
csv_if_exist	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class</li> </ul> <p><b>‘anyblok.column.Selection’&gt;</b></p> <ul style="list-style-type: none"> <li>• selections:</li> <li>• (‘pass’, ‘Pass to the next record’)</li> <li>• (‘overwrite’, ‘Update the record’)</li> <li>• (‘create’, ‘Create another record’)</li> <li>• (‘raise’, ‘Raise an exception’)</li> <li>• size - 64</li> <li>• DB column name - None</li> <li>• foreign_key - None</li> <li>• default - overwrite</li> <li>• Label - None</li> </ul>

**class** anyblok.bloks.io\_csv.importer.**CSV** (*importer*)  
Bases: object

**Declaration type** Model

**Tablename** io\_importer\_csv

**Registry name** Model.IO.Importer.CSV

**Inherit model or mixin**

**exporter**

**class** anyblok.bloks.io\_csv.exporter.**Exporter**  
Bases: anyblok.mixin.IOCSVMixin

**Declaration type** Model

**Tablename** io\_exporter

**Registry name** Model.IO.Exporter

**Inherit model or mixin**

- <class 'anyblok.mixin.IOCSVMixin'>

**class** anyblok.bloks.io\_csv.exporter.**Field**  
Bases: anyblok.mixin.IOCSVFieldMixin

**Declaration type** Model

**Tablename** io\_exporter\_field

**Registry name** Model.IO.Exporter.Field

**Inherit model or mixin**

- <class 'anyblok.mixin.IOCSVFieldMixin'>

field name	Description
exporter	<ul style="list-style-type: none"> <li>•Context:</li> <li>•unique - False</li> <li>•info:</li> <li>•remote_name - fields_to_export</li> <li>•remote_model - Model.IO.Exporter</li> <li>•nullable - False</li> <li>•Field type - &lt;class 'any-blok.relationship.Many2One'&gt;</li> <li>•_remote_columns - None</li> <li>•_column_names - None</li> <li>•backref - fields_to_export</li> <li>•model - Model.IO.Exporter</li> <li>•Label - None</li> </ul>
mapping	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> </ul>
mode	<ul style="list-style-type: none"> <li>•Context:</li> <li>•is crypted - False</li> <li>•Field type - &lt;class 'any-blok.column.Selection'&gt;</li> <li>•nullable - False</li> <li>•selections - get_selection</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - any</li> <li>•Label - None</li> </ul>

**class** anyblok.bloks.io\_csv.exporter.CSV (*exporter*)

Bases: object

**Declaration type** Model

**Tablename** io\_exporter\_csv

**Registry name** Model.IO.Exporter.CSV

**Inherit model or mixin**

## 8.4 Blok IO XML

**class** anyblok.bloks.io\_xml.**AnyBlokIOXML**(registry)

Bases: anyblok.blok.Blok

XML Importer / Exporter behaviour

**Warning:** Importer and Exporter are not implemented yet

```
conditional_by = []
conflicting_by = []
classmethod import_declaration_module()
name = 'anyblok-io-xml'
optional_by = []
classmethod reload_declaration_module(reload)
required = ['anyblok-io']
required_by = []
version = '0.9.3'
```

---

**Note:** Require the anyblok-io-xml blok

---

### 8.4.1 Exporter

TODO

### 8.4.2 Importer

Add an importer mode (XML) in AnyBlok:

```
Importer = registry.IO.Importer.XML
```

Define what import:

```
model = ``Existing model name``
with open(..., 'rb') as fp:
    file_to_import = fp.read()
```

Create the Exporter:

```
importer = Importer.insert(model=model,
                           file_to_import=file_to_import)
```

**Warning:** You can also make insert with registry.IO.Importer directly

Run the import:

```
res = importer.run()
```

The result is a dict with:

- `error_found`: List the error, durring the import
- `created_entries`: Entries created by the import
- `updated_entries`: Entries updated by the import

Root structure of the XML file:

```
<records on_error="...">
  ...
</records>
```

`raise` can have the value:

- `raise` (dafault)
- `ignore`

`records` node can have:

- `commit`: commit the import, only if no error found
- `record`: import one record

Add a record:

```
<records>
  <record>
    ...
    <field name="..." />
    ...
  </record>
</records>
```

Record attribute:

- `model`: if not filled, then the importer will indicate the model
- `external_id`: Mapping key
- `param`: Mapping key only for the import (not save)
- **`on_error`:**
  - `raise`
  - `ignore` (default)
- **`if_exist`:**
  - `overwrite` (default)
  - `create`
  - `pass`: continue to the next record
  - `continue`: continue on the sub record without take this record
  - `raise`
- **`id_does_not_exist`:**
  - `create` (default)
  - `pass`
  - `raise`



The field node represents a Field, a Column or Relationship, the attributes are:

- **name** (required): name of the field, column or relationship

Case of the relationship, they have some more attributes:

- **external\_id**:
- **param**:
- **on\_error**:
  - raise
  - ignore (default)
- **if\_exist**:
  - overwrite (default)
  - create
  - pass: continue to the next record
  - continue: continue on the sub record without take this record
  - raise
- **id\_does\_not\_exist**:
  - create (default)
  - pass
  - raise

Many2One and One2One declaration is directly in the field node:

```
<records
  <record
    ...
    <field name="Many2One or One2One">
      ...
      <field name="..." />
      ...
    </field>
    ...
  </record>
</records>
```

One2Many and Many2Many declarations are also in the field but with a record node:

```
<records
  <record
    ...
    <field name="Many2Many or One2Many">
      ...
      <record>
        ...
        <field name="..." />
        ...
      </record>
      ...
    </field>
    ...
  </record>
</records>
```

```
</record>
</records>
```

### 8.4.3 API doc

#### exceptions

**exception** `anyblok.bloks.io_xml.exceptions.XMLImporterException`  
Bases: `anyblok.bloks.io.exceptions.ImporterException`

Simple exception for XML importer

**exception** `anyblok.bloks.io_xml.exceptions.XMLExporterException`  
Bases: `anyblok.bloks.io.exceptions.ExporterException`

Simple exception for XML exporter

#### importer

**class** `anyblok.bloks.io_xml.importer.Importer`  
Bases: `object`

**Declaration type** `Model`

**Tablename** `io_importer`

**Registry name** `Model.IO.Importer`

**Inherit model or mixin**

**class** `anyblok.bloks.io_xml.importer.XML(importer)`  
Bases: `object`

**Declaration type** `Model`

**Tablename** `io_importer_xml`

**Registry name** `Model.IO.Importer.XML`

**Inherit model or mixin**

#### exporter

**class** `anyblok.bloks.io_xml.exporter.Exporter`  
Bases: `object`

**Declaration type** `Model`

**Tablename** `io_exporter`

**Registry name** `Model.IO.Exporter`

**Inherit model or mixin**

**class** `anyblok.bloks.io_xml.exporter.XML(exporter)`  
Bases: `object`

**Declaration type** `Model`

**Tablename** `io_exporter_xml`

**Registry name** `Model.IO.Exporter.XML`

**Inherit model or mixin**

## 8.5 Blok Model Auth

```
class anyblok.bloks.model_authz.ModelBasedAuthorizationBlok (registry)
    Bases: anyblok.blok.Blok

    conditional_by = []
    conflicting_by = []
    classmethod import_declaration_module ()
    name = 'model_authz'
    optional_by = []
    classmethod reload_declaration_module (reload)
    required_by = []
    version = '0.9.3'
```

### 8.5.1 API doc

```
class anyblok.bloks.model_authz.models.ModelPermissionGrant
    Bases: object

    Default model for ModelBasedAuthorizationRule

    Declaration type Model
    Tablename authorization_modelpermissiongrant
    Registry name Model.Authorization.ModelPermissionGrant
    Inherit model or mixin
```

field name	Description
model	<ul style="list-style-type: none"> <li>•Context:</li> <li>•primary_key - True</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> <li>•is crypted - False</li> </ul>
permission	<ul style="list-style-type: none"> <li>•Context:</li> <li>•primary_key - True</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> <li>•is crypted - False</li> </ul>
principal	<ul style="list-style-type: none"> <li>•Context:</li> <li>•primary_key - True</li> <li>•Field type - &lt;class 'any-blok.column.String'&gt;</li> <li>•size - 64</li> <li>•DB column name - None</li> <li>•foreign_key - None</li> <li>•default - &lt;class 'any-blok.column.NoDefaultValue'&gt;</li> <li>•Label - None</li> <li>•is crypted - False</li> </ul>

---

## CHANGELOG

---

### 9.1 0.9.3 (2016-10-12)

- [FIX] SQLAlchemy 1.1.\* add `autoincrement='auto'`, or `AnyBlok` wait `Boolean`. If the field is an `Integer` and a `primary_key` with `autoincrement='auto'` then the value is `True` else `False`
- [FIX] SQLAlchemy 1.1.\*, `primary_key` attribute don't define `autoincrement`. The column `Integer` with a `primary_key=True` without `autoincrement` declaration use `autoincrement=True`
- [FIX] SQLAlchemy 1.1.\*, `backref` property check if the `collection_class` has `__emulates__` attributes. `InstrumentedList` haven't to have this attribute
- [FIX] SQLAlchemy 1.1.\*, Session State changed, update the update method of the registry to install / update / uninstall bloks
- [FIX] SQLAlchemy 1.1.\*, Hybrid property don't propagate the relationship info attribute. The propagate is forced for `Many2One` and `One2One`. The only both relationships to be wrapped by `hybrid_property`
- [FIX] SQLAlchemy 1.1.\*, Hybrid property wrap the `fget` result in the case of the `fget` is called on the class (not the instance). Adapt the unit test, don't check if the result id of column are the same, check if the expression give by this results are the same.
- [FIX] SQLAlchemy 1.1.\*, `listen` can not be used with a `hybrid_property`. In the case of a `listen`, the mapper returned is not the `hybrid_property` but the real wrapped field

### 9.2 0.9.2 (2016-10-12)

- [FIX] `setup.py`: error with `pip`

### 9.3 0.9.1 (2016-10-3)

- [FIX] migration testcase
- [FIX] graphviz FORMATS
- [FIX] travis configuration

## 9.4 0.9.0 (2016-07-11)

- [REF] add Configuration.has method
- [FIX] test migration, force to load registry with unittest=True
- [FIX] test event
- [FIX] test blok
- [FIX] mapper with None parameter
- [FIX] add set\_defaults in parser to update configuration dict
- [FIX] one2many remote columns
- [FIX] load anyblok.init in the unit test
- [IMP] Add plugins by configuration for:
  - Registry
  - Migration
  - get\_url
- [IMP] add LogCapture
- [IMP] TestCase.Configuration, use to update Configuration only in a context manager
- [IMP] add Registry.db\_exists class method, check with the configuration and the db\_name if the connection is possible

## 9.5 0.8.5 (2016-06-20)

- [FIX] utf-8 encoding
- [REF] move bitbucket (mergural) to github (git)

## 9.6 0.8.4 (2016-06-14)

- [FIX] io/xml/importer one2many field
- [FIX] install blok, who are not in the blok list yet. But the blok is loaded

## 9.7 0.8.3 (2016-04-18)

- [FIX] cache and classmethod\_cache on SQL model
- [ADD] is\_installed classmethod cache

## 9.8 0.8.2 (2016-04-06)

- [REF] IO.Mapping methods delete and multi\_delete can remove entry
- [FIX] datetime with timezone use timezone.localize, better than datetime.replace(tzinfo=...)
- [ADD] update sphinx extension

## 9.9 0.8.1 (2016-03-15)

- [FIX] #21 Improve Decimal column setter
- [FIX] #22 String, uString, Text and uText write ' ' in database for False value
- [FIX] Change the external\_id save in a two way
- [FIX] #23 Column.Selection with None value, don't return 'None' value by the getter

## 9.10 0.8.0 (2016-02-05)

**Warning:** Break the compatibility with the previous version of anyblok

- update method on the model replace

```
obj.update({field1: val1, ...})
```

by:

```
obj.update(field1=val1, ...)
```

- [REF] session expire is now on the attribute, the update method is refactored too.
- [FIX] blok: update version if the version change
- [REF] add required blok, this bloks is installed and updated by the scripts anyblok\_updatedb and anyblok\_createdb
- [ADD] Add Color Column
- [REF] column can be encrypted
- [REF] DateTime column is not a naive datetime value
- [ADD] Add Password Column
- [ADD] Add UUID Column
- [ADD] Add URL Column

## 9.11 0.7.2 (2016-01-14)

- [FIX] delete flush after remove of the session
- [FIX] nose plugins

- [FIX] doesn't destroy automatically constraints (not created by anyblok), indexes (not created by anyblok), columns, tables by automigration, add options to force the delete of its.
- [REF] standardize the constraint and index names
- [FIX] Multi declaration of the same foreign key in the case of M2O and O2O
- [REF] SqlBase.update, become high level meth

## 9.12 0.7.1 (2016-01-08)

- [FIX] didn't cast the config data from the config file
- [IMP] copy init entry point from anyblok\_pyramid

## 9.13 0.7.0 (2016-01-07)

<b>Warning:</b> Python 3.2 is not supported
---

- [REF] Add options to give database url, No break compatibility
- [REF] **the argument of ArgumentParser can be add in the configuration**
  - Improve the help of the application
  - Improve the type of the configuration, Work also with config file.
  - Adapt current configuration
- [REF] start to use sqlalchemy-utils, replace the database management
- [IMP] [#18](#) Forbidden the declaration of SQLAlchemy column or relationship
- [REF] [#15](#) Refactor unittest case to not create/drop database for each test
- [FIX] [#19](#) During migration if an unique constraint must be apply without unique value, then the constraint will be ignore and log a warning. No break the instalation of the blok
- [FIX] [#20](#) Update meth: expire the instance cause of relationship
- [IMP] refresh and expire meth on model
- [REF] delete obj, flush the session and delete the instance of obj of the session, before expire all the session, the goal is to reload the relation ship.
- [REF] [#13](#) Remove association model, replace it by call at the Blok definition
- [IMP] [#14](#) Add conflicting link between blok, two blok who are in conflict can be installed if the other is installed

## 9.14 0.6.0 (2016-01-07)

- [REF] unittest isolation
- [IMP] possibility to apply an extension for sqlalchemy
- [ADD] pool configuration



## 9.15 0.5.2 (2015-09-28)

- [IMP] extension for Sphinx and autodoc
- [ADD] API doc in doc
- [ADD] add foreign key option in relation ship
- [CRITICAL FIX] the EnvironnementManager didn't return the good scoped method for SQLAlchemy
- [CRITICAL FIX] the precommit\_hook was not isolated by session
- [REF] add a named argument `must_be_loaded_by_unittest`, by default `False`, in `Configuration.add` to indicate if the function must be call during the initialisation of the unittest, generally for the configuration initialized by Environ variable

## 9.16 0.5.1 (2015-08-29)

- [IMP] unload declaration type callback

## 9.17 0.5.0 (2015-08-28)

**Warning:** Break the compatibility with the previous version of anyblok

- `cache`, `classmethod_cache`, `hybrid_method` and `listen` replace:

```
from anyblok import Declarations
cache = Declarations.cache
classmethod_cache = Declarations.classmethod_cache
hybrid_method = Declarations.hybrid_method
addListener = Declarations.addListener
```

by:

```
from anyblok.declarations import (cache, classmethod_cache,
                                  hybrid_method, listen)
```

---

**Note:** The listener can declare SQLAlchemy event

---

- declaration of the foreign key replace:

```
@register(Model):
class MyClass:

    myfield = Integer(foreign_key=(Model.System.Blok, 'name'))
    myotherfield = Integer(foreign_key=('Model.System.Blok', 'name'))
```

by:

```
@register(Model):
class MyClass:

    myfield = Integer(foreign_key=Model.System.Blok.use('name'))
    myotherfield = Integer(foreign_key="Model.System.Blok=>name")
```

- [IMP] add `pop` behaviour on **Model.System.Parameter**
- [REF] Load configuration before load bloks, to use Configuration during the declaration
- [FIX] all must return InstrumentedList, also when the result is empty
- [FIX] `to_dict` must not cast column
- [REF] add third entry in foreign key declaration to add options
- [IMP] `ModelAttribute` used to declare the need of specific attribute and get the attribute or the foreign key from this attribute
- [IMP] `ModelAttributeAdapter`, get a `ModelAttribute` from `ModelAttribute` or `str`
- [IMP] `ModelRepr`, Pseudo representation of a Model
- [IMP] `ModelAdapter`, get a `ModelRepr` from `ModelRepr` or `str`
- [IMP] `ModelMapper` and `ModelAttributeMapper`
- [REF] Event, the declaration of an event can be an anyblok or a sqlalchemy event
- [REF] the foreign key must be declared with `ModelAttribute`
- [REF] Use Adapter for Model and attribute in relation ship
- [REF] `hybrid_method`, `cache` and `classmethod_cache` are now only impotable decorator function
- [IMP] in column the default can be a classmethod name
- [REF] replace all the field (prefix, suffix, ...) by a formater field. It is a python formater string
- [IMP] Sequence column
- [IMP] add the default system or user configuration file

## 9.18 0.4.1 (2015-07-22)

<b>Warning:</b> Field Function change, <code>fexp</code> is required if you need filter
---

- [FIX] `Field.Function`, `fexp` is now a class method
- [REF] reduce flake8 complexity
- [REF] refactor field function
- [FIX] inherit relation ship from another model, thank Simon ANDRÉ for the bug report
- [REF] table/mapper args definition
- [REF] Refactor Field, Column, Relationship use now polymorphic inherit
- [FIX] Foreign key constraint, allow to add and drop constraint on more than one foreign key
- [ADD] update-all-bloks option
- [ADD] pre / post migration
- [REF] UML Diagram is now with autodoc script
- [REF] SQL Diagram is now with autodoc script
- [REF] Add **extend** key word in configuration file to extend an existing configuration

## 9.19 0.4.0 (2015-06-21)

**Warning:** Break the compatibility with the previous version of anyblok

- [REF] Add the possibility to add a logging file by argparse
- [ADD] No auto migration option
- [ADD] Plugin for nose to run unit test of the installed bloks
- [REF] The relation ship can be reference more than one foreign key
- [IMP] Add define\_table/mapper\_args methods to fill \_\_table/mapper\_args\_\_ class attribute need to configure SQLAlachemy models
- [REF] Limit the commit in the registry only when the SQA Session factory is recreated
- [REF] Commit and re-create the SQA Session Factory, at installation, only if the number of Session inheritance of the number of Query inheritance change, else keep the same session
- [REF] Exception is not a Declarations type
- [FIX] Reload fonctionnality in python 3.2
- [REF] Remove the Declarations types Field, Column, Relationship, they are replaced by python import
- [REF] rename **ArgsParseManager** by **Configuration**
- [REF] rename **reload\_module\_if\_blok\_is\_reloaded** by **reload\_module\_if\_blok\_is\_reloading** method on blok
- [REF] rename **import\_cfg\_file** by **import\_file** method on blok
- [REF] Consistency the argsparse configuration
- [REF] refactor part\_to\_load, the entry points loaded is bloks
- [IMP] Allow to define another column name in the table versus model
- [FIX] add importer for import configuration file
- [FIX] x2M importer without field just, external id

## 9.20 0.3.5 (2015-05-10)

- [IMP] When a new column is add, if the column have a default value, then this value will be added in all the entries where the value is null for this column
- [REF] import\_cfg\_file remove the importer when import has done

## 9.21 0.3.4 (2015-05-10)

- [ADD] logger.info on migration script to indicate what is changed
- [IMP] Add sequence facility in the declaration of Column
- [ADD] ADD XML Importer

## 9.22 0.3.3 (2015-05-04)

- [FIX] createdb script

## 9.23 0.3.2 (2015-05-04)

- [IMP] doc
- [REF] Use logging.config.configFile

## 9.24 0.3.1 (2015-05-04)

- [IMP] Update setup to add documentation files and blok's README

## 9.25 0.3.0 (2015-05-03)

- [IMP] Update Doc
- [FIX] Remove nullable column, the nullable constraint is removed not the column
- [ADD] Formater, convert value 2 str or str 2 value, with or without mapping
- [ADD] CSV Importer
- [REF] CSV Exporter to use Formater

## 9.26 0.2.12 (2015-04-29)

- [IMP] CSV Exporter
- [IMP] Exporter Model give external ID behaviour
- [ADD] Sequence model (Model.System.Sequence)
- [ADD] fields\_description cached\_classmethod with invalidation
- [ADD] Parameter Model (Model.System.Parameter)
- [FIX] environnement variable for test unitaire

## 9.27 0.2.11 (2015-04-26)

- [FIX] UNIT test createdb with prefix

## 9.28 0.2.10 (2015-04-26)

- [IMP] add enviroment variable for database information
- [ADD] argsparse option install all bloks
- [FIX] Python 3.2 need that bloks directory are python modules, add empty `__init__` file

## 9.29 0.2.9 (2015-04-18)

- [FIX] Add all rst at the main path of all the bloks

## 9.30 0.2.8 (2015-04-16)

- [IMP] unittest on SQLBase
- [IMP] add delete method on SQLBase to delete une entry from an instance of the model
- [REF] rename `get_primary_keys` to `get_mapping_primary_keys`, cause of `get_primary_keys` already exist in SQLBase

## 9.31 0.2.7 (2015-04-15)

- [IMP] Add IPython support for interpreter
- [REF] Update and Standardize the method to field the models (Field, Column, Relationship) now all the type of the column go on the ftype and comme from the name of the class

## 9.32 0.2.6 (2015-04-11)

- [FIX] use the backref name to get the label of the remote relation ship
- [FIX] add type information of the simple field

## 9.33 0.2.5 (2015-03-23)

- [FIX] In the parent / children relationship, where the pk is on a mixin or from inherit
- [FIX] How to Environment
- [FIX] Many2Many declared in Mixin
- [IMP] Many2One can now declared than the local column must be unique ( only if the local column is not declared in the model)

## 9.34 0.2.3 (2015-03-23)

**Warning:** This version can be not compatible with the version **0.2.2**. Because in the foreign key model is a string you must replace the tablename by the registry name

- [FIX] Allow to add a relationship on the same model, the main use is to add parent / children relation ship on a model, They are any difference with the declaration of ta relation ship on another model
- [REF] standardize foreign\_key and relation ship, if the str which replace the Model Declarations is now the registry name

## 9.35 0.2.2 (2015-03-15)

- [REF] Unittest
  - TestCase and DBTestCase are only used for framework
  - **BlokTestCase is used:**
    - \* by `run_exit` function to test all the installed bloks
    - \* at the installation of a blok if wanted

## 9.36 0.2.0 (2015-02-13)

**Warning:** This version is not compatible with the version **0.1.3**

- [REF] Import and reload are more explicite
- [ADD] IO:
  - Mapping: Link between Model instance and (Model, str key)
- [ADD] Env in registry\_base to access at EnvironmentManager without to import it at each time
- [IMP] doc add how to on the environment

## 9.37 0.1.3 (2015-02-03)

- [FIX] setup long description, good for pypi but not for easy\_install

## 9.38 0.1.2 (2015-02-02)

- [REFACTOR] Allow to declare Core components
- [ADD] Howto declare Core / Type
- [FIX] Model can only inherit simple python class, Mixin or Model
- [FIX] Mixin inherit chained
- [FIX] Flake8

## 9.39 0.1.1 (2015-01-23)

- [FIX] version, documentation, setup

## 9.40 0.1.0 (2015-01-23)

Main version of AnyBlok. You can with this version

- Create your own application
- Connect to a database
- Define bloks
- Install, Update, Uninstall the blok
- Define field types
- Define Column types
- Define Relationship types
- Define Core
- Define Mixin
- Define Model (SQL or not)
- Define SQL view
- Define more than one Model on a specific table
- Write unittest for your blok

### Contents

- *ROADMAP*
  - *To implement*
  - *Library to include*
  - *Functionnality which need a sprint*





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## ROADMAP

---

### 10.1 To implement

- Add slogan
- Update doc
- Need improve alembic, sqlalchemy-util
- Refactor the engine declarations to have master / slave(s) configuration
- Addons for sqlalchemy : <http://sqlalchemy-utils.readthedocs.org/en/latest/installation.html>

### 10.2 Library to include

- full text search: <https://pypi.python.org/pypi/SQLAlchemy-FullText-Search/0.2>
- internationalisation: <https://pypi.python.org/pypi/SQLAlchemy-i18n/0.8.2>
- sqltap <http://sqltap.inconshreveable.com>, profiling and introspection for SQLAlchemy applications
- Crypt <https://bitbucket.org/zzzeek/sqlalchemy/wiki/UsageRecipes/DatabaseCrypt>
- profiling <https://bitbucket.org/zzzeek/sqlalchemy/wiki/UsageRecipes/Profiling>

### 10.3 Functionnality which need a sprint

- Tasks Management
- Internalization
- Ancestor left / right

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