
AnyBlok Documentation

Release 0.1.1

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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

Information about the AnyBlok project.

1.1 Project Homepage

AnyBlok is hosted on [Bitbucket](https://bitbucket.org/jssuzanne/anyblok) - the main project page is at <https://bitbucket.org/jssuzanne/anyblok> or <http://code.anyblok.org>. Source code is tracked here using [Mercurial](#).

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>.

The latest stable documentation is for the release 0.1.0 at <http://docs.anyblok.org/0.1.0>

1.2 Project Status

AnyBlok is currently in beta 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 <http://code.anyblok.org/get/default.tar.gz>. or <http://code.anyblok.org/get/default.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.

1.4 Unit Test

Run the test with `nose`:

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

1.5 Dependencies

AnyBlok works with **Python 3.2** and later. The install process will ensure that [SQLAlchemy](#), [Alembic](#) are installed, in addition to other dependencies. AnyBlok will work with SQLAlchemy as of version **0.9.8**. AnyBlok will work with Alembic as of version **0.7.3**. 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
- Sandrine Chaufournais
- Jean-Sébastien Suzanne
- Florent Jouatte
- Simon André
- Clovis Nzouendjou
- Pierre Verkest
- 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 an existing 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 Create your Blok group

A blok group is just a `setuptools` entry point. Splitting the project into several groups allows to select the bloks needed by the application. This separation also allows a blok to come from more than one blok group: it is not the same blok but they have the same name. You can provide two implementations for the same thing and use the right implementation depending on the context.

For this example, the blok group `WorkBlok` will be used

2.2 Create Your Blok

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:

We declare 4 bloks in the `setup.py` file:

```
WorkBlok = [  
    '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={  
        'WorkBlok': WorkBlok,  
    },  
)
```

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 the modules and packages in this package be imported by anyblok.

Warning: The modules and packages starting with `_` are not imported, the package tests are also not imported.

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()

# 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()

# position.py describe the model Position
```

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

- required: the 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.

Employee blok

File tree:

```
employee_blok
-- __init__.py
-- argsparse.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()

# employee.py describe the model Employee
```

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

EmployeePosition blok:

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 Chaufournais': 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()

```

Warning: There are no strong dependencies between conditional bloks and the blok, so the priority must be increased. The bloks are loaded by dependencies and priorities. A blok a with small dependency will be loaded before a blok with a high dependency.

2.3 Create Your Model

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 subclass 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
register = Declarations.register
Model = Declarations.Model
String = Declarations.Column.String

```

```
@register(Model)
class ASQLModel:

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

Warning: Each SQL Model must have one or more primary_key

Warning: The table name depends on the registry tree. Here the table is asqlcolumn. 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
register = Declarations.register
Model = Declarations.Model
Integer = Declarations.Column.Integer
String = Declarations.Column.String
Many2One = Declarations.Relationship.Many2One

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



```
String = Declarations.Column.String

@register(Model)
class Position:

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

    def __str__(self):
        return self.name
```

employee_blok.employee:

```
from anyblok import Declarations
register = Declarations.register
Model = Declarations.Model
String = Declarations.Column.String
Many2One = Declarations.Relationship.Many2One

@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
register = Declarations.register
Model = Declarations.Model
Many2One = Declarations.Relationship.Many2One

@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.arsparse:

```
from anyblok._argparse import ArgsParseManager

@ArgsParseManager.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 your 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'],
        'WorkBlok': WorkBlok,
    },
)
```

The script must display:

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

script:

```
import anyblok
from logging import getLogger
from anyblok._argparse import ArgsParseManager

logger = getLogger(__name__)

def exampleblok():
    # Initialise the application, with a name and a version number
    # select the groupe of options to display
    # select the groups of bloks available
    # return a registry if the database are selected
    registry = anyblok.start(
        'Example Blok', '1.0',
        argsparse_groups=['config', 'database', 'message'],
        parts_to_load=['AnyBlok', 'WorkBlok'])

    if not registry:
        return

    message_before = ArgsParseManager.get('message_before')
```

```

message_after = ArgsParseManager.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] [-c CONFIGFILE] [--message-before MESSAGE_BEFORE]
                  [--message-after MESSAGE_AFTER] [--db_name DBNAME]
                  [--db_drivername DBDRIVERNAME] [--db_username DBUSERNAME]
                  [--db_password DBPASSWORD] [--db_host DBHOST]
                  [--db_port DBPORT]

```

Example Blok - 1.0

optional arguments:

```

-h, --help            show this help message and exit
-c CONFIGFILE         Relative path of the config file

```

This is the 'message' group:

```

--message-before MESSAGE_BEFORE
--message-after MESSAGE_AFTER

```

Database:

```

--db_name DBNAME      Name of the database
--db_drivername DBDRIVERNAME
                        the name of the database backend. This name will
                        correspond to a module in sqlalchemy/databases or a
                        third party plug-in
--db_username DBUSERNAME

```

The user name

```

--db_password DBPASSWORD

```

database password

```

--db_host DBHOST      The name of the host
--db_port DBPORT      The port number

```

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_s
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 b
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'
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
2014-11-29 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 'system_cache_id_s
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2014-11-29 10:54:29 INFO - anyblok:root - Registry.reload
2014-11-29 10:54:29 INFO - anyblok:root - Registry.load
2014-11-29 10:54:29 INFO - anyblok:anyblok.registry - Blok 'anyblok-core' loaded
2014-11-29 10:54:29 INFO - anyblok:anyblok.registry - Blok 'office' loaded
2014-11-29 10:54:29 INFO - anyblok:anyblok.registry - Blok 'position' loaded
2014-11-29 10:54:29 INFO - anyblok:anyblok.registry - Blok 'employee' loaded
2014-11-29 10:54:29 INFO - anyblok:anyblok.registry - Blok 'employee-position' loaded
2014-11-29 10:54:29 INFO - anyblok:anyblok.registry - Assemble 'Model' entry
2014-11-29 10:54:29 INFO - anyblok:alembic.migration - Context impl PostgresqlImpl.
2014-11-29 10:54:29 INFO - anyblok:alembic.migration - Will assume transactional DDL.
2014-11-29 10:54:29 INFO - anyblok:alembic.ddl.postgresql - Detected sequence named 'system_cache_id_s
2014-11-29 10:54:29 INFO - anyblok:alembic.autogenerate.compare - Detected added column 'employee.posi
2014-11-29 10:54:29 WARNING - anyblok:anyblok.migration - (IntegrityError) column "position_name" cont
'ALTER TABLE employee ALTER COLUMN position_name SET NOT NULL' {}
2014-11-29 10:54:29 INFO - anyblok:anyblok.registry - Initialize 'Model' entry
2014-11-29 10:54:29 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Install the k
2014-11-29 10:54:30 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Load the blo
2014-11-29 10:54:30 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Load the blo
2014-11-29 10:54:30 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Load the blo
2014-11-29 10:54:30 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Load the blo
2014-11-29 10:54:30 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Load the blo
2014-11-29 10:54:30 INFO - anyblok:exampleblok.scripts - Get the employee ...
2014-11-29 10:54:30 INFO - anyblok:exampleblok.scripts - Sandrine Chaufourais 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 S
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
2014-1129 10:57:52 INFO - anyblok:anyblok.registry - Initialize 'Model' entry
2014-1129 10:57:52 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Load the blo
2014-1129 10:57:52 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Load the blo
2014-1129 10:57:52 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Load the blo
2014-1129 10:57:52 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Load the blo
2014-1129 10:57:52 INFO - anyblok:anyblok.bloks.anyblok_core.declarations.system.blok - Load the blo
2014-1129 10:57:52 INFO - anyblok:exampleblok.scripts - Get the employee ...
2014-1129 10:57:52 INFO - anyblok:exampleblok.scripts - Sandrine Chaufournaïs in Room 308 at 14-16 ru
2014-1129 10:57:52 INFO - anyblok:exampleblok.scripts - Christophe Combelles in Room 308 at 14-16 rue
2014-1129 10:57:52 INFO - anyblok:exampleblok.scripts - Clovis Nzouendjou in Room 308 at 14-16 rue S
2014-1129 10:57:52 INFO - anyblok:exampleblok.scripts - Florent Jouatte in Room 308 at 14-16 rue Sole
2014-1129 10:57:52 INFO - anyblok:exampleblok.scripts - Simon André in Room 308 at 14-16 rue Soleille
2014-1129 10:57:52 INFO - anyblok:exampleblok.scripts - Jean-Sébastien Suzanne in Room 308 at 14-16 r
2014-1129 10:57:52 INFO - anyblok:exampleblok.scripts - Georges Racinet in Room 308 at 14-16 rue Sole
2014-1129 10:57:52 INFO - anyblok:exampleblok.scripts - Pierre Verkest in Room 308 at 14-16 rue Sole
2014-1129 10:57:52 INFO - anyblok:exampleblok.scripts - Franck Bret in Room 308 at 14-16 rue Soleille
2014-1129 10:57:52 INFO - anyblok:exampleblok.scripts - End ...

```

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

2.7 Create an interpreter

Anyblok provides some functions to help creating an application:

- `createdb`
- `updatedb`

- interpreter

Here is how to create an interpreter:

```
from anyblok.scripts import interpreter
```

```
def exampleblok_interpreter():
    anyblok_interpreter(
        'Interpreter', '1.0',
        argsparse_groups=['config', 'database', 'interpreter'],
        parts_to_load=['AnyBlok', 'WorkBlok'])
```

```
jssuzanne:anyblok jssuzanne$ ./bin/exampleblok_interpreter -c anyblok.cfg
2014-0428 20:57:38 INFO - anyblok:root - Registry.load
2014-0428 20:57:38 INFO - anyblok:anyblok.registry - Blok 'anyblok-core' loaded
2014-0428 20:57:38 INFO - anyblok:anyblok.registry - Blok 'office' loaded
2014-0428 20:57:38 INFO - anyblok:anyblok.registry - Blok 'position' loaded
2014-0428 20:57:38 INFO - anyblok:anyblok.registry - Blok 'employee' loaded
2014-0428 20:57:38 INFO - anyblok:anyblok.registry - Blok 'employee-position' loaded
2014-0428 20:57:38 INFO - anyblok:anyblok.registry - Assemble 'Model' entry
2014-0428 20:57:39 INFO - anyblok:alembic.migration - Context impl PostgresqlImpl.
2014-0428 20:57:39 INFO - anyblok:alembic.migration - Will assume transactional DDL.
2014-0428 20:57:39 INFO - anyblok:anyblok.registry - Initialize 'Model' entry
Python 3.3.5 (default, Mar 12 2014, 15:18:42)
[GCC 4.2.1 Compatible Apple LLVM 5.1 (clang-503.0.38)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
(InteractiveConsole)
>>>
```

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MEMENTO

Anyblok mainly depends on:

- Python 3.3+
- SQLAlchemy
- Alembic

3.1 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>

And the methods that define blok behaviours:

Method	Description
<code>clean_before_reload</code>	class method, call before Python reload of the blok. Use only if an action must be executed before reloading the blok
<code>update</code>	Action to do when the blok is being installed 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

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

```
from setuptools import setup

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

3.2 Declaration

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

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

The `Declarations` has two main methods

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

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

- Model
- Column
- ...

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

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

3.3.1 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
```

3.3.2 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

3.3.3 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.

3.4 Column

To declare a Column in a model, add a column on the table of the model. All the column type are in the Declarations:

```
from anyblok.declarations import Declarations

Integer = Declarations.Column.Integer
String = Declarations.Column.String

@Declarations.register(Declaration.Model)
```

```
class MyModel:

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

List of the Declarations of the column type:

- DateTime: use `datetime.datetime`
- Decimal: use `decimal.Decimal`
- Float
- Time: use `datetime.time`
- BigInteger
- Boolean
- Date: use `datetime.date`
- Integer
- Interval: use the `datetime.timedelta`
- LargeBinary
- SmallInteger
- String
- Text
- uString
- uText
- Selection
- Json

All the columns have the following 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
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: <pre>@register(Model) class Foo: id : Integer(primary_key=True) @register(Model) class Bar: id : Integer(primary_key=True) foo : Integer(foreign_key=(Model.Foo, 'id'))</pre>

Other attribute for String and uString:

Param	Description
size	Column size in the bdd

Other attribute for Selection:

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

3.5 Relationship

To declare a Relationship in a model, add a Relationship on the table of the model. All the Relationship types are in the Declarations:

```
from anyblok.declarations import Declarations

Integer = Declarations.Column.Integer
Many2One = Declarations.Relationship.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)
```

List of the Declarations 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 relationship
nullable	Indicates if the column name is nullable or not
backref	Remote One2One 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 relation ship
nullable	Indicate if the column name is nullable or not
one2many	Opposite One2Many link with this Many2one

Parameters of the One2Many field:

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

Parameters of the Many2Many field:

Parameter	Description
join_table	many2many intermediate table between both models
m2m_remote_column	Column name in the join table which have got the foreign key to the remote model
local_column	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_column	Column name in the join table which holds the foreign key to the model
many2many	Opposite Many2Many link with this relationship

3.6 Field

To declare a Field in a model, add a Field on the Model, this is not a SQL column. All the Field type are in the Declarations:

```
from anyblok.declarations import Declarations

Integer = Declarations.Column.Integer
```



```

Fuction = Declarations.Field.Function

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

    id = Integer(primary_key=True)
    myid = Function(fget='get_my_id')

    def get_my_id(self):
        return self.id

```

List of the Declarations 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 self.id</pre>
model	The remote model
remote_column	The column name on the remote model, if no remote columns are given, the remote column will be the primary column of the remote model

3.7 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')
```

3.8 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)
```

3.9 Core

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

3.9.1 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
```

3.9.2 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
```

3.9.3 SqlViewBase

Like SqlBase, only the SqlView inherits this Core class.

```
from anyblok import Declarations

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

3.9.4 Query

Overloads the SQLAlchemy Query class.

```
from anyblok import Declarations

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

3.9.5 Session

Overloads the SQLAlchemy Session class.

```
from anyblok import Declarations

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

3.9.6 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)
```

3.10 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.

3.11 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

3.12 Specific behaviour

AnyBlok implements some facilities to help developers

3.12.1 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 `Declarations.cache` or `Declarations.classmethod_cache` to apply a cache on a method

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()
```

3.12.2 Event

Simple implementation of a synchronous event:

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

@register(Model)
class Test:

    x = 0

    @Declarations.addListener(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 `addListener` which binds the decorated method to the event.
- **fire method with the following parameters:**
 - `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 `addListener` decorator but the classmethod decorator, because the method name is already seen as an event listener

3.12.3 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:

```
@register(Model)
class Test:

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

3.12.4 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')
```

3.12.5 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

AnyBlok framework

4.1 anyblok module

`anyblok.start` (*processName*, *version*='0.1.1', *prompt*='%(*processName*)s - %(*version*)s',
argsparse_groups=None, *parts_to_load*=None, *logger*=None)
 Function which initialize the application

```
registry = start('My application',
                 argsparse_groups=['config', 'database'],
                 parts_to_load=['AnyBlok'])
```

Parameters

- **processName** – Name of the application
- **version** – Version of the application
- **prompt** – Prompt message for the help
- **argsparse_groups** – list of the group of option for argparse
- **parts_to_load** – group of blok to load
- **logger** – option to configure logging

Return type registry if the database name is in the configuration

4.2 anyblok.declarations module

`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 Column(*args, **kwargs)
    Column class
```

This class can't be instanciated

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

native_type ()

Return the native SQLAlchemy type

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.Exception`

Adapter to Exception Class

The Exception class is used to define the type of Declarations Exception

Add new Exception type:

```
@Declarations.register(Declarations.Exception)
class MyException:
    pass
```

Removing the exception is forbidden because it can be used

exception `ArgsParseManagerException`

Simple Exception for ArgsParseManager

exception `Declarations.Exception.BlokManagerException` (**args, **kwargs*)

Simple exception to BlokManager

exception `Declarations.Exception.DeclarationsException`

Simple Exception for Declarations

exception `Declarations.Exception.EnvironmentException`
Exception for the Environment

exception `Declarations.Exception.FieldException`
Simple Exception for Field

exception `Declarations.Exception.ImportManagerException`
Exception for Import Manager

exception `Declarations.Exception.MigrationException`
Simple Exception class for Migration

exception `Declarations.Exception.RegistryException`
Simple Exception for Registry

exception `Declarations.Exception.RegistryManagerException`
Simple Exception for Registry

classmethod `Declarations.Exception.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 to add in the declaration

Exception `DeclarationsException`

classmethod `Declarations.Exception.unregister` (*entry, cls_*)
Forbidden method
Exception `DeclarationsException`

class `Declarations.Field` (**args, **kwargs*)
Field 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_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`

native_type ()
Return the native SQLAlchemy type
Exception `FieldException`

classmethod **register** (*parent, name, cls_, **kwargs*)
add new sub registry in the registry
Parameters

- **parent** – Parent to attach the declaration to
- **name** – Name of the new field
- **cls** – Class to add in the declaration

Exception FieldException

classmethod unregister (*child, cls_*)

Forbidden method

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

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, blok='MyBlok')
```

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 unregister (*entry, cls_*)

Remove the Interface in the registry

Parameters

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

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, blok='MyBlok')
```

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_cache` (*registry, namespace, base, properties*)

Find the cached methods in the base to apply the real cache decorator

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 `apply_event_listener` (*registry, namespace, base, properties*)

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

classmethod `apply_hybrid_method` (*registry, namespace, bases, 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
- **properties** – the properties of the model

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

Transform the sqlmodel 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** (*registry, namespace, base, properties*)

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

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, 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
- **properties** – the properties of the model

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

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

class `Declarations.Relationship` (**args, **kwargs*)

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

check_existing_remote_model (*registry*)

Check if the remote model exists

The information of the existence come from the first step of assembling

Exception `FieldException` if the model doesn't exist

find_primary_key (*properties*)

Return the primary key come from the first step property

Parameters **properties** – first step properties for the model

Return type column name of the primary key

Exception `FieldException`

get_registry_name ()

Return the registry name of the remote model

Return type str of the registry name

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

get_tablename (*registry*)

Return the table name of the remote model

Return type str of the table name

classmethod `Declarations.add_declaration_type` (*cls_=None, isAnEntry=False, assemble=None, initialize=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)

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_`

4.3 anyblok._argparse module

class `anyblok._argparse.ArgsParseManager`

`ArgsParse` 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 `ArgsParser` after loading

classmethod `add` (*group, part='AnyBlok', label=None, function_=None*)

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

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

•or by calling the add method as a decorator:

```
@ArgsParseManager.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:

```
@ArgsParseManager.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

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 ArgsParseManager. And all the applications have free access to these options:

```
from anyblok._argparse import ArgsParseManager

database = ArgsParseManager.get('dbname')
```

..warning:

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

Parameters

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

classmethod get_url (*dbname=None*)

Return an sqlalchemy URL for database

Get the options of the database, the only option which can be overloaded is the name of the database:

```
url = ArgsParseManager.get_url(dbname='Mydb')
```

Parameters dbname – Name of the database

Return type SQLAlchemy URL

Exception ArgsParseManagerException

classmethod `remove` (*group*, *function_*, *part*=*'AnyBlok'*)

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  
  
ArgsParseManager.add('create-db', function_=foo)  
ArgsParseManager.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*=*'AnyBlok'*)

Remove an existing label

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

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

Parameters

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

4.4 anyblok._imp module

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 ImportError

classmethod `has (blok)`

Return True if the blok was imported

Parameters `blok` – name of the blok to add

Return type boolean

4.5 anyblok._logging module

class `anyblok._logging.Formatter (fmt=None, datefmt=None, style='%')`

Bases: `logging.Formatter`

Define the format for console logging

format (`record`)

Add color to the message

Parameters `record` – logging record instance

Return type logging record formatted

`anyblok._logging.init_logger (level='info', mode='console', filename=None, socket=None, facility=8)`

Init the logger output

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

Example:

```
from anyblok.log import init_logger
init_logger(level='debug')
```

A logger can log to:

•console (default):

```
init_logger(mode='console')
```

•file:

```
init_logger(mode='file', filename='my.file.log')
```

•socket:

```
init_logger(mode='socket', socket=('localhost', 1000))
```

•syslog:

Example:

```
# By socket
init_logger(mode='syslog', socket=('localhost', 514))
# By UNIX socket
init_logger(mode='syslog', socket='/dev/log')
```

the syslog mode define logger facility:

```
-LOG_AUTH
-LOG_AUTHPRIV
-LOG_CRON
-LOG_DAEMON
-LOG_FTP
-LOG_KERN
-LOG_LPR
-LOG_MAIL
-LOG_NEWS
-LOG_SYSLOG
-LOG_USER (default)
-LOG_UUCP
-LOG_LOCAL0
-LOG_LOCAL1
-LOG_LOCAL2
-LOG_LOCAL3
-LOG_LOCAL4
-LOG_LOCAL5
-LOG_LOCAL6
-LOG_LOCAL7
```

example:

```
init_logger(mode='syslog', socket='/dev/log',
            facility=syslog.LOG_SYSLOG)
```

Parameters

- **level** – level defined by anyblok
- **mode** – Output mode
- **filename** – Output file
- **socket** – Socket or UnixSocket
- **facility** –

Exception

`anyblok._logging.log(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:

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

Parameters

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

4.6 anyblok.environment module

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

4.7 anyblok.blok module

class `anyblok.blok.BlokManager`

Manage the bloks for one process

A blok has a *setuptools* entrypoint, this entry point is defined by the `bloks_groups` 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('AnyBlok')
```

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 has (*blok*)

Return True if the blok is loaded

Parameters **blok** – blok name

Return type bool

classmethod list ()

Return the ordered bloks

Return type list of blok name ordered by loading

classmethod load (**bloks_groups*)

Load all the bloks and import them

Parameters **bloks_groups** – Use by `iter_entry_points` to get the blok

Exception `BlokManagerException`

classmethod reload()

Reload the entry points

Empty the `bloks` dict and use the `bloks_groups` 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
- **conditionnal**: if all the bloks of this list are installed then install this blok
- **imports**: list of the python file to import

4.8 anyblok.registry module

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_entry` (*entry, assemble_callback=None, initialize_callback=None*)

Add new entry in the declared entry

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

def initialize_callback(registry):
    ...

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

Parameters

- **entry** – entry name
- **assemble_callback** – function callback to call to assemble
- **initialize_callback** – function callback to call to init after assembling

classmethod `get` (*dbname*)

Return an existing Registry

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

Parameters **dbname** – 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 blos loaded must be initialized because the registry will be created with this information

Parameters **blokname** – name of the blok

classmethod `reload` (*blok*)

Reload the blok

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

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

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` ()

Unload the registry blos

class `anyblok.registry.Registry` (*dbname*)

Define one registry

A registry is linked to a database, and stores the definition of the installed Blos, 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

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

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 (*loaded*)

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

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

precommit_hook (*registryname, method, put_at_the_if_exist*)

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_if_exist** – if true and hook already exist then the hook are moved at the end

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

4.9 anyblok.migration module

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

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** (*column*)
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 (*remote_field*, ***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 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

foreign_key()
Get a foreign key

Return type MigrationConstraintForeignKey instance

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 (*name, condition*)
Add the constraint

Parameters

- **name** – name of the constraint
- **condition** – constraint to apply

Return type MigrationConstraintCheck instance

drop()
Drop the constraint

class anyblok.migration.**MigrationConstraintUnique** (*table, *columns, **kwargs*)
Used for the Unique constraint

Add a new constraint:

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

Get and drop the constraint:

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

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

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 (*columns, **kwargs)

Get unique

Parameters *columns – List of the column's name

Return type MigrationConstraintUnique instance

class anyblok.migration.**Migration** (session, metadata)

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 automaticly

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

4.10 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

4.11 anyblok.databases module

Management of the database

```

adapter = getUtility(ISqlAlchemyDataBase, drivename)
adapter.createdb(dbname)
logger.info(adapter.listdb())
adapter.dropdb(dbname)

```

4.11.1 anyblok.databases.postgres module

class `anyblok.databases.postgres.SqlAlchemyPostgres`

Postgres adapter for database management

cnx ()

Context manager to get a connection to database

createdb (*dbname*)

Create a database

Parameters **dbname** – database name to create**dropdb** (*dbname*)

Drop a database

Parameters **dbname** – database name to drop

listdb()

list database

Return type list of database name

4.12 anyblok.scripts module

anyblok.scripts.createdb (*description, argspare_groups, parts_to_load*)

Create a database and install blok from config

Parameters

- **description** – description of argspare
- **argsparse_groups** – list argspare groupe to load
- **parts_to_load** – group of blok to load

anyblok.scripts.updatedb (*description, version, argspare_groups, parts_to_load*)

Update an existing database

Parameters

- **description** – description of argspare
- **version** – version of script for argspare
- **argsparse_groups** – list argspare groupe to load
- **parts_to_load** – group of blok to load

anyblok.scripts.interpreter (*description, version, argspare_groups, parts_to_load*)

Execute a script or open an interpreter

Parameters

- **description** – description of argspare
- **version** – version of script for argspare
- **argsparse_groups** – list argspare groupe to load
- **parts_to_load** – group of blok to load

anyblok.scripts.sqlschema (*description, version, argspare_groups, parts_to_load*)

Create a Table model schema of the registry

Parameters

- **description** – description of argspare
- **version** – version of script for argspare
- **argsparse_groups** – list argspare groupe to load
- **parts_to_load** – group of blok to load

anyblok.scripts.modelschema (*description, version, argspare_groups, parts_to_load*)

Create a UML model schema of the registry

Parameters

- **description** – description of argspare
- **version** – version of script for argspare

- **argsparse_groups** – list argsparse groupe to load
- **parts_to_load** – group of blok to load

Helper for unittest

For unittest, classes are available to offer some fonctionnalités

5.1 TestCase

```
from anyblok.tests.testcase import TestCase
```

```
class anyblok.tests.testcase.TestCase (methodName='runTest')
    Bases: unittest.case.TestCase
```

Unittest class add helper for unit test in anyblok

```
classmethod createdb (keep_existing=False)
    Create a database in fonction of variable of environment
```

```
cls.init_argparse_manager()
cls.createdb()
```

Parameters **keep_existing** – If false drop the previous db before create it

```
classmethod dropdb ()
    Drop a database in fonction of variable of environment
```

```
cls.init_argparse_manager()
cls.dropdb()
```

```
getRegistry ()
    Return the registry for the database in argspare i
```

```
registry = self.getRegistry()
```

Return type registry instance

```
classmethod init_argparse_manager (prefix=None, **env)
    Initialise the argspare 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

5.2 DBTestCase

Warning: this testcase destroys the test database for each unittest

class anyblok.tests.testcase.**DBTestCase** (*methodName='runTest'*)

Bases: anyblok.tests.testcase.TestCase

Test case for all the Field, Column, Relationship

```
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)
```

Warning: The database are create and drop for each unit test

current_blok = 'anyblok-core'

In the blok to add the new model

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

parts_to_load = ['AnyBlok']

blok group to load

setUp ()

Create a database and load the blok manager

classmethod setUpClass ()

Intialialise the argsparse manager

tearDown ()

Clear the registry, unload the blok manager and drop the database

upgrade (*registry*, ***kwargs*)
Upgrade the registry:

```
class MyTest (DBTestCase):

    def test_mytest(self):
        registry = self.init_registry(...)
        self.upgrade(registry, install=('MyBlok',))
```

Parameters

- **registry** – registry to upgrade
- **install** – list the blok to install
- **update** – list the blok to update
- **uninstall** – list the blok to uninstall

5.3 BlokTestCase

class anyblok.tests.testcase.**BlokTestCase** (*methodName='runTest'*)

Bases: anyblok.tests.testcase.TestCase

Use to test bloks without have to create new database for each test

```
from anyblok.tests.testcase import BlokTestCase

class MyBlokTest (BlokTestCase):

    parts_to_load = ['AnyBlok']
    need_blok = ['blok 1', 'blok 2', ..., 'blok n']

    def test_1(self):
        ...
```

need_blok = ['anyblok-core']

List of the blok need for this test

parts_to_load = None

Group of blok to load

classmethod setUpClass ()

Intialialise the argsparse manager

Deactivate the commit method of the registry

tearDown ()

Roll back the session

classmethod tearDownClass ()

Clear the registry, unload the blok manager

upgrade (***kwargs*)

Upgrade the registry:

```
class MyTest (DBTestCase):
```

```
def test_mytest(self):  
    self.registry.upgrade(install=('MyBlok',))
```

Parameters

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

6.1 anyblok-core blok

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:

- Core model
- Field Type
 - Function
- Column Types:
 - DateTime
 - Decimal
 - Float
 - Time
 - BigInteger
 - Boolean
 - Date
 - Integer
 - Interval
 - LargeBinary
 - SmallInteger
 - String
 - Text
 - uString
 - uText
 - Selection
 - Json

•**Relationship types**

- One2One
- Many2One
- One2Many
- Many2Many

•**System Models**

- Blok
- Model
- Field
- Column
- Relationship

autoinstall = True

priority = 0

version = '0.0.1'

CHANGELOG

7.1 0.1.0 (Next Version)

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

ROADMAP

8.1 Next step before 0.1

- Add logo and slogan

8.2 Next step for the 0.2

- Access Rules / Roles

8.3 To implement

- Add Relationship model in anyblok-core and refactor the get column <http://docs.sqlalchemy.org/en/latest/faq.html#how-do-i-get-a-list-of-all-columns-relationships-mapped-attributes-etc-given-a-mapped-class>
- Put postgres database in his own distribution with the good import

8.4 Library to include

- Addons for sqlalchemy : <http://sqlalchemy-utils.readthedocs.org/en/latest/installation.html>
- 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>

8.5 Web client

- <http://www.javascriptkit.com/javatutors/closuresleak/index.shtml>
- <http://www.javascriptkit.com/javatutors/crossmenu.shtml>

- cms <https://github.com/Kotti/Kotti>

8.6 Fonctionnalité which need a sprint

- Back Task
- Cron
- Tasks Management
- Event by messaging bus
- Import / Export
- Internalization
- Ancestor left / right
- Access Rules / Roles

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9.1 1. Definitions

9.1.1 1.1. “Contributor”

Means each individual or legal entity that creates, contributes to the creation of, or owns Covered Software.

9.1.2 1.2. “Contributor Version”

Means the combination of the Contributions of others (if any) used by a Contributor and that particular Contributor’s Contribution.

9.1.3 1.3. “Contribution”

Means Covered Software of a particular Contributor.

9.1.4 1.4. “Covered Software”

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Means any form of the work other than Source Code Form.

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9.1.13 1.13. “Source Code Form”

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