django-crucrudile Documentation

Release 1.0.0-rc1

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July 29, 2014

Contents

CHAPTER 1

Installation

Contents

At this time, the only requirements to run `django-crucrudile` are **Python** (3.3, 3.4), and **Django** (1.6). Django will be installed automatically if needed.

Note : backporting for Python 2.6 or could be done easily, ping me if you need it.

1.1 From Python package index

To install from PyPI

```
pip install django-crucrudile
```

(This installs the latest release in https://pypi.python.org/pypi/django-crucrudile/)

1.2 From Git tags

To install from Git master branch

```
pip install -e git+https://github.com/pstch/django-crucrudile.git@master#egg=django-crucrudile
```

(This installs the latest release (major, minor or patch) in the master branch, use `@develop` to install development version. You can also use `@tag`, replacing tag by a release name (ex: 'v1.4.1') (Git tag, see Releases tab in GitHub).

To install from Git develop branch

```
pip install -e git+https://github.com/pstch/django-crucrudile.git@develop#egg=django-crucrudile
```

1.3 From source

To install from source

```
git clone https://github.com/pstch/django-crucrudile.git
cd django-crucrudile
python setup.py install
```

If you want the development version (default branch is `master`, containing latest release), run `git checkout develop` before `python setup.py install`

`django-crucrudile` is a Python package, and it does **not** need to be included as an application (in `INSTALLED_APPS`) in Django. You only need to import the needed modules in your Python files.

CHAPTER 2

Getting started

Contents

Warning: WIP (final draft done, needs rereading)

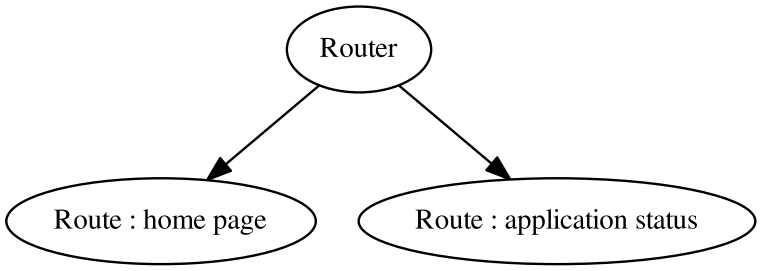
2.1 Introduction

2.1.1 Abstract

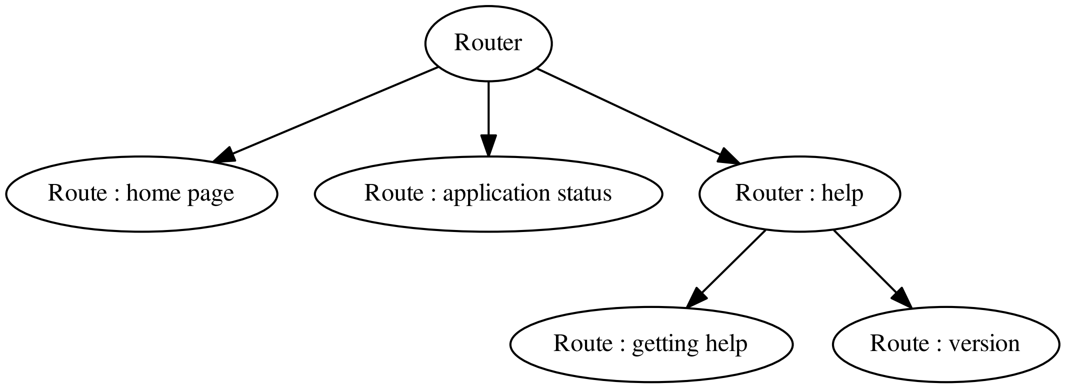
This package can be used to simplify Django's URL pattern definitions. It's able to generate a Django URL pattern structure from a directed acylic graph represented using :

- Routes (leaves in the graph), contain URL patterns
- Routers (nodes in the graph), contain routes

Example :



A router can also contain other routers :



This allows us to define complex routing graphs using combinations of route and router objects. The route and router objects handle :

- URL namespaces (in routers)
- URL regex building (with multiple parts, routers can also prefix the routes they contain using their own URL regex part)
- building a Django URL pattern tree

Warning: The routing graph must be **acyclic** as we parse it recursively, using a depth-first search. (django-crucrudile does not (yet ?) support infinite routing graphs)

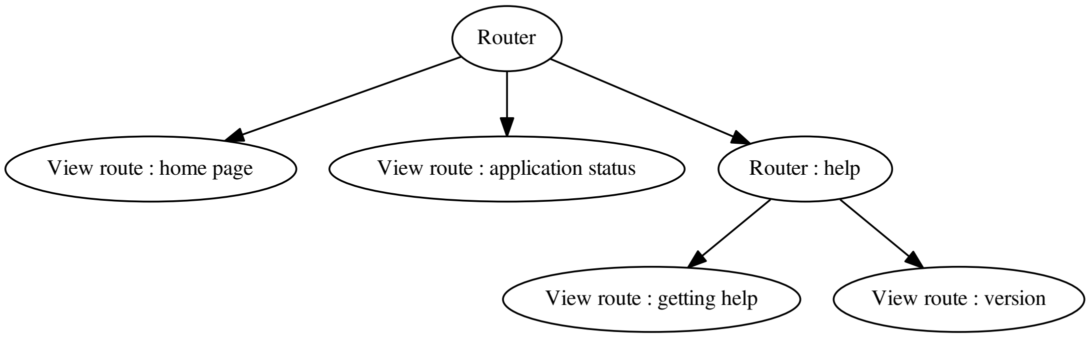
2.1.2 Routes and router

Here, we defined a routing graph, but we never actually defined what to point our routes to. In fact, the above structure could not be created in django-crucrudile, because a route is an abstract object (Python abstract class) that doesn't know what callback to use in its generated patterns.

As the route is an abstract object, we use "implementations" of this object (they know what callback to use in the generated patterns, they are "concrete"). django-crucrudile provides two basic implementations of the route class :

- Callback route : a simple route that uses a given callback
- View route : a route that uses a callback from a given Django view class.

If we take that previous example, using view routes in lieu of routes, we get :



Note: The view route leaves in this example are **instances of the view route class**. They need a view_class to get instantiated. The route names (that will be used to build the URL regex as well as the URL name) should also be passed to the constructor (otherwise the route name will be built from the view class name, stripping of the tailing "View" if needed).

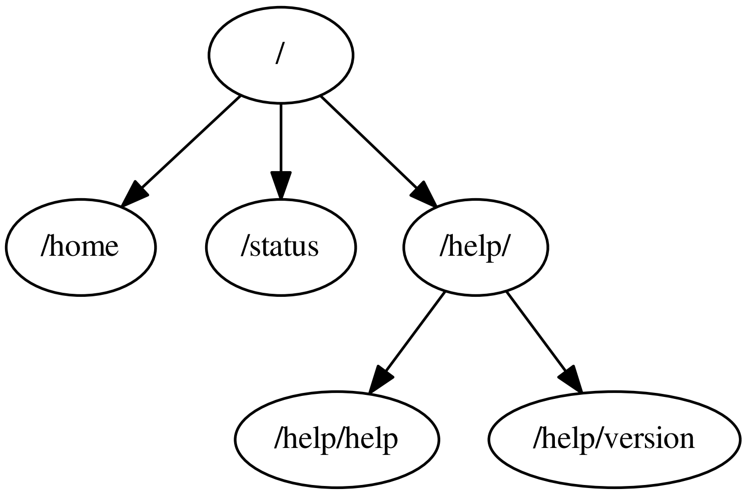
Note: The router nodes in this example are **instances of the router class**. They don't need anything to get instantiated, but they can take a router name (used to build the router URL part) and a router namespace (used to wrap routers in Django URL namespaces).

Here is the code corresponding to that example :

```
>>> # these two lines are required to subclass Django model in doctests
>>> import tests.unit
>>> __name__ = "tests.doctests"

>>> from django.views.generic import TemplateView
>>> from django_crucrudile.routers import Router, ViewRoute
>>>
>>> class HomeView(TemplateView):
...   pass
>>>
>>> class StatusView(TemplateView):
...   pass
>>>
>>> class HelpView(TemplateView):
...   pass
>>>
>>> class VersionView(TemplateView):
...   pass
```

```
>>> router = Router()
>>>
>>> router.register(ViewRoute(HomeView)) is not None
True
>>> router.register(ViewRoute(StatusView)) is not None
True
>>>
>>> help_router = Router(url_part='help')
>>>
>>> help_router.register(ViewRoute(HelpView)) is not None
True
>>> help_router.register(ViewRoute(VersionView)) is not None
True
>>>
>>> router.register(help_router) is help_router
True

>>> print(router.get_str_tree())
...
 - Router  @ ^
   - home @ ^home$ HomeView
   - status @ ^status$ StatusView
   - Router  @ ^help/
     - help @ ^help$ HelpView
     - version @ ^version$ VersionView

>>> list(router.patterns())
[<RegexURLResolver <RegexURLPattern list> (None:None) ^>]
```

As you can see, we can pass the URL part to the help router, to prefix the resulting URL patterns. Here are the URLs corresponding to that example :



The generator returned the `patterns()` function of the router yields URL objects that can be used in the `url_patterns` attribute of `urls.py`.

2.2 Index URLs and redirections

The base route and router objects support setting an object as “index”, which means that when it is added to a router, the router set it as its redirect target.

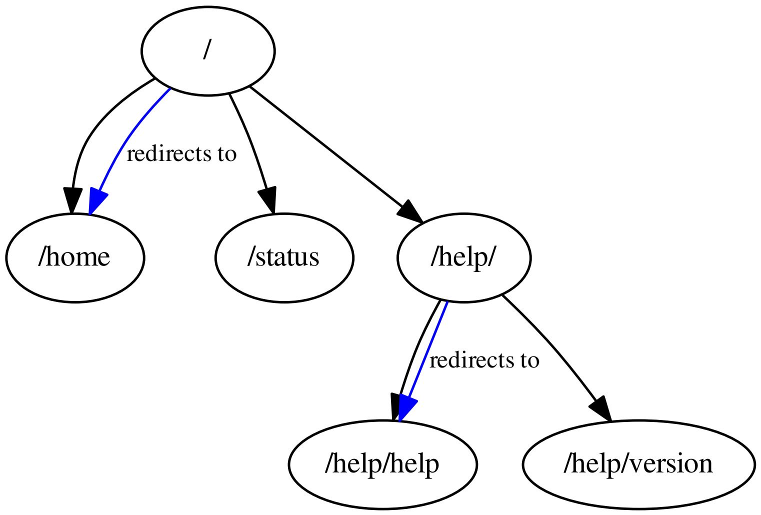
In the previous example, if the home route was as index, requests to “/” would get redirected to “/home”.

To achieve this, a route is added in each router that has a rediect. This route is a view route that uses a Django generic redirection view that points to the redirect target. If the redirect target is itself a router, we use this router’s redirect target, and so on, until we find a route.

To mark a route or router as “index”, set its `index` attribute to `True`. You can also add it as index, using the `index` argument of the register method : that won’t alter the `index` attribute, but will still add as index.

Here is what the previous example would look like, with a redirection from “/” to “/home” and from “/help/” to “/help/help” :

```
>>> # these two lines are required to subclass Django model in doctests
>>> import tests.unit
>>> __name__ = "tests.doctests"

>>> from django.views.generic import TemplateView
>>> from django_crucrudile.routers import Router, ViewRoute
>>>
>>> class HomeView(TemplateView):
...   pass
>>>
>>> class StatusView(TemplateView):
...   pass
>>>
>>> class HelpView(TemplateView):
...   pass
>>>
>>> class VersionView(TemplateView):
...   pass

>>> router = Router()
>>>
>>> router.register(ViewRoute(HomeView), index=True) is not None
True
>>> router.register(ViewRoute(StatusView)) is not None
True
>>>
>>> help_router = Router(url_part='help')
>>>
>>> help_router.register(ViewRoute(HelpView), index=True) is not None
True
>>> help_router.register(ViewRoute(VersionView)) is not None
True
>>>
>>> router.register(help_router) is help_router
True

>>> print(router.get_str_tree())
...
 - Router  @ ^
   - home-redirect @ ^$ RedirectView
   - home @ ^home$ HomeView
   - status @ ^status$ StatusView
   - Router  @ ^help/
     - help-redirect @ ^$ RedirectView
     - help @ ^help$ HelpView
     - version @ ^version$ VersionView

>>> list(router.patterns())
[<RegexURLResolver <RegexURLPattern list> (None:None) ^>]
```



2.3 Using with models

The base route and router classes can be extended using “model mixins”, that implement model-related functionality. Model mixins make the object require a model class (set as class attribute or passed in constructor).

For a router, this means in particular that it will use the model to get its URL part.

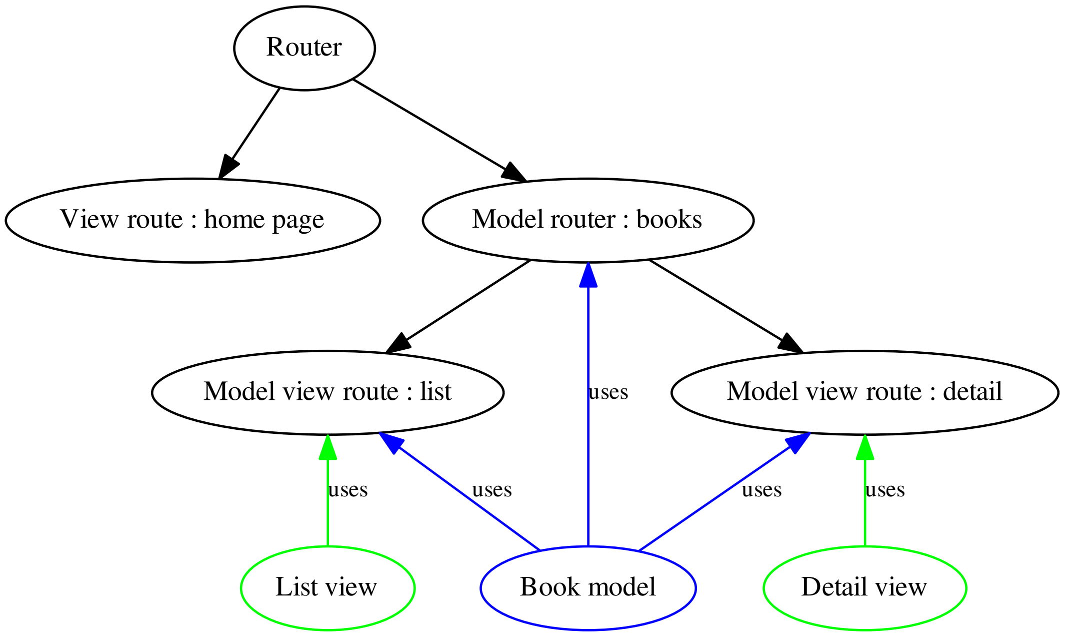
For a route, this implies that it will use the model to get the the URL name.

Route mixins can be used with view mixins. If the view with a generic view, the model argument should also be passed (a “model view route” is provided, that already implements this). In the following example, we naively use the model and view mixins, and assume that the views are not generic (that they already know which model to use).

Example :

```
>>> # these two lines are required to subclass Django model in doctests
>>> import tests.unit
>>> __name__ = "tests.doctests"

>>> from django.views.generic import ListView, DetailView, TemplateView
>>> from django.db.models import Model
>>> from django_crucrudile.routers import Router, ModelRouter
>>> from django_crucrudile.routes import ViewRoute, ModelViewRoute
>>>
```

```
>>> class HomeView(TemplateView):
...   pass
>>>
>>> class Book(Model):
...   pass
>>>
>>> class BookListRoute(ModelViewRoute):
...    model = Book
...    view_class = ListView
>>>
>>> class BookDetailRoute(ModelViewRoute):
...    model = Book
...    view_class = DetailView

>>> router = Router()
>>>
>>> router.register(ViewRoute(HomeView)) is not None
True
>>>
>>> books_router = ModelRouter(Book)
>>>
>>> books_router.register(BookListRoute()) is not None
True
>>> books_router.register(BookDetailRoute()) is not None
True
>>>
>>> router.register(books_router) is books_router
True

>>> print(router.get_str_tree())
...
 - Router  @ ^
   - home @ ^home$ HomeView
   - ModelRouter book @ ^book/
     - book-list @ ^list$ ListView
     - book-detail @ ^detail$ DetailView

>>> list(router.patterns())
[<RegexURLResolver <RegexURLPattern list> (None:None) ^>]
```



As you see, it is required to pass to model to the router **and** to the route. It's not actually required to use the model route and in a model router, and the model route actually supports this use case by being able to prefix the URL itself (not relying on the parent router, as it does by default).

Note: It's not possible to automatically pass attributes from a router to its children, as the routes and routers are already instantiated when they get registered to the router.

However, a similar pattern, that is very useful for defining "generic" routers (that can automatically create the router and routes for an object), can be achieved using "register mappings". A register mapping is a mapping of a type to a callable, that is used when registering objects in a router. If the object matches a type in the mapping, the object is passed to the callable value, and the return value of this callable is registered. You could for example map `Model` to a view route class, and call the register function with the model class. The object that will be registered will be an instance of a view route, constructed using the model class.

Please refer to Register mappings documentation for more information.

Note: Predefined routers can also be defined : when they get instantiated, they automatically instantiate classes that are present in their "base store" (a class-level attribute), and register thems in their store. For example, you could create a predefined model router that contains model view route classes that use for Django generic views, and then instantiate that model router with a model class as argument. The result would be a model router that contains model view route instances, that use the model router model with Django generic views.

Please refer to Predefined routers documentation for more information.

2.4 Arguments

The base route class can be extended using an arguments mixin, that allows to give the route an arguments specification, that will be used in the URL regex.

Note: The arguments route mixin is included in the default concrete route classes

The arguments mixin uses an arguments parser, to create the possible arguments regexs from the argument specification. The default arguments parser uses a cartesian product to allow variants of an arguments to be used, and allows arguments to be optional, meaning that their separator (`/`) will be optional (`/?`).

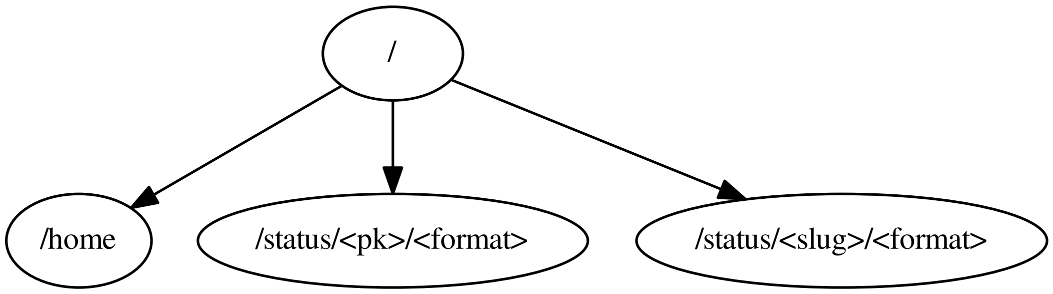
It is absolutely not required to use these features, you can define the arguments regex yourself as well : just use your argument regex as a single item in the arguments spec, and it won't be processed.

For more information on how argument specifications are parsed, and more examples of argument specifications, see `django_crucrudile.routes.mixins.arguments.ArgumentsMixin`.

The following example uses this argument specification :

- a required argument, that can be either "<pk>" or "<slug>"
- an optional argument, "<format>"

```
>>> # these two lines are required to subclass Django model in doctests
>>> import tests.unit
>>> __name__ = "tests.doctests"

>>> from django.views.generic import TemplateView
>>> from django_crucrudile.routers import Router, ViewRoute
>>>
>>> class HomeView(TemplateView):
...   pass
>>>
>>> class StatusView(TemplateView):
...   pass
>>>
>>> router = Router()
>>>
>>> router.register(ViewRoute(HomeView)) is not None
True
>>> router.register(
...   ViewRoute(
...     StatusView,
...     arguments_spec=[["<pk>", "<slug>"], (False, "<format>")]
...   )
... ) is not None
True

>>> print(router.get_str_tree())
...
 - Router  @ ^
   - home @ ^home$ HomeView
   - status @ ^status/<pk>/?<format>$ StatusView
   - status @ ^status/<slug>/?<format>$ StatusView
```



2.5 Register mappings

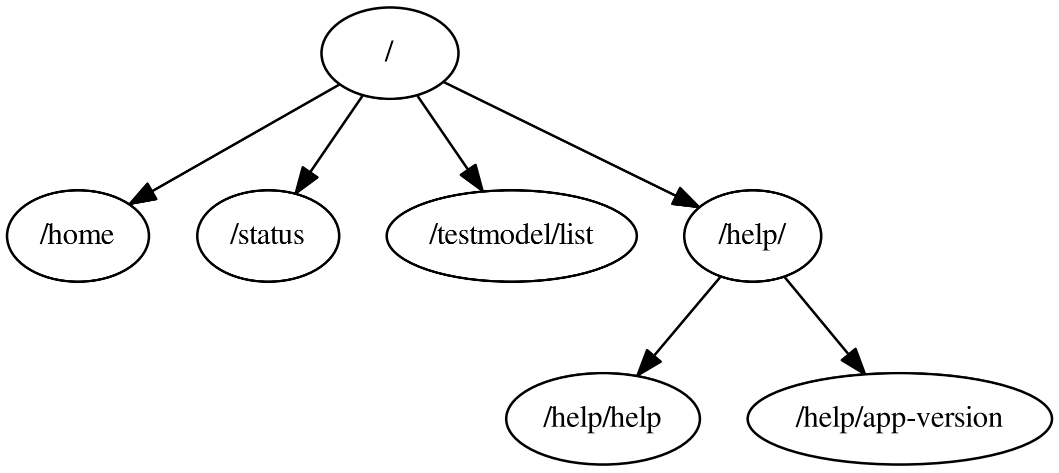
A router instance, when registering an object, checks if the object matches any of the register mappings. If it finds a match, it calls the mapping value using the object as argument, and registers the resulting object in its store.

This allows to create routers on which you can register models, or view classes, or any object for which you want to abstract the route definition in a class.

In the following example, we give view classes as arguments to the register functions, also passing the arguments to pass when calling the mapping value :

```
>>> # these two lines are required to subclass Django model in doctests
>>> import tests.unit
>>> __name__ = "tests.doctests"

>>> from django.views.generic import TemplateView, ListView
>>> from django.db.models import Model
>>> from django_crucrudile.routers import Router
>>>
>>> class HomeView(TemplateView):
...   pass
>>>
>>> class StatusView(TemplateView):
...   pass
>>>
>>> class HelpView(TemplateView):
...   pass
>>>
>>> class VersionView(TemplateView):
...   pass
>>>
... class TestModel(Model):
...   pass
>>>

>>> router = Router()
>>>
>>> router.register(HomeView) is not None
True
```

```
>>> router.register(StatusView) is not None
True
>>>
>>> router.register(
...   ListView,
...   map_kwargs=dict(
...     model=TestModel,
...     prefix_url_part=True
...   )
... ) is not None
True
>>>
>>> help_router = Router(url_part='help')
>>>
>>> help_router.register(HelpView) is not None
True
>>> help_router.register(
...   VersionView,
...   map_kwargs=dict(name='app-version')
... ) is not None
True
>>>
>>> router.register(help_router) is help_router
True

>>> print(router.get_str_tree())
...
 - Router  @ ^
   - home @ ^home$ HomeView
   - status @ ^status$ StatusView
   - testmodel-list @ ^testmodel/list$ ListView
   - Router  @ ^help/
     - help @ ^help$ HelpView
     - app-version @ ^app-version$ VersionView

>>> list(router.patterns())
[<RegexURLResolver <RegexURLPattern list> (None:None) ^>]
```



As shown here, some register mappings are already defined in the base router, they allow to transform view classes in view routes, model view classes in model view routes, and model classes in a generic model router (see Predefined routers).

To provide your own register mappings, just override the corresponding function (see `django_crucrudile.routers.Router`).

2.6 Predefined routers

It is also possible for router classes to contain classes in a "base store" (the base store is specific to each subclass). When the router is instantiated, these classes will be instantiated and registered.

This base store uses "register functions", as the standard store : to add a class, call the class register method. The base store supports register mappings, as the standard store. These mappings are separate from the standard register mappings, and usually called "class register mappings".

```
>>> # these two lines are required to subclass Django model in doctests
>>> import tests.unit
>>> __name__ = "tests.doctests"

>>> from django.views.generic import TemplateView
>>> from django_crucrudile.routers import Router
>>> from django_crucrudile.routes import ViewRoute
>>>
>>> class HomeView(TemplateView):
...   pass
>>>
>>> class StatusView(TemplateView):
...   pass
>>>
>>> class HomeRoute(ViewRoute):
...   view_class = HomeView
>>>
```

```
>>> class StatusRoute(ViewRoute):
...     view_class = StatusView
>>>

>>>
... class HomeRouter(Router):
...     pass
>>>
>>> HomeRouter.register_class(HomeRoute) is HomeRoute
True
>>> HomeRouter.register_class(StatusRoute) is StatusRoute
True
>>>
>>> router = HomeRouter()
...
>>> print(router.get_str_tree())
...
 - HomeRouter  @ ^
   - home @ ^home$ HomeView
   - status @ ^status$ StatusView

>>> list(router.patterns())
[<RegexURLResolver <RegexURLPattern list> (None:None) ^>]
```

As the instances that are automatically registered when the router is instantiated may also be transformed by the register mappings, we can even directly register the view class on the router :

```
>>>
... class HomeRouter(Router):
...     pass
>>>
>>> HomeRouter.register_class(lambda: HomeView) is not None
True
>>> HomeRouter.register_class(lambda: StatusView) is not None
True
>>>
>>> router = HomeRouter()

>>> print(router.get_str_tree())
...
 - HomeRouter  @ ^
   - home @ ^home$ HomeView
   - status @ ^status$ StatusView

>>> list(router.patterns())
[<RegexURLResolver <RegexURLPattern list> (None:None) ^>]
```

This allows easily creating generic, reusable routers that automatically implement specific features (as routes, or even other routers).

This feature is used in django-crucrudile to provide a generic model router, that requires a model and creates routes for Django generic views. The following example shows how such a generic model router can be created. **The implementation in django-crucrudile is actually very similar (if not identical) to this code, and in most cases you should be able to directly use the generic model router provided by django-crucrudile.**

This example also shows another route : the generic model view route. This route uses a mixin that provides automatic URL arguments based on the generic view class. By making the transformed view classes use this generic model view route, instead of the default model view route, it also shows how to add a register class mapping to the router.

```
>>> # these two lines are required to subclass Django model in doctests
>>> import tests.unit
>>> __name__ = "tests.doctests"
>>>
>>> from django.db.models import Model
>>> from django.views.generic.detail import SingleObjectMixin
>>> from django.views.generic.list import MultipleObjectMixin
>>> from django.views.generic import (
...     ListView, DetailView,
...     CreateView, UpdateView, DeleteView
... )
>>> from django_crucrudile.routers import ModelRouter
>>> from django_crucrudile.routes import GenericModelViewRoute
>>>
>>> class TestModel(Model):
...   pass
>>>
>>> class GenericModelRouter(ModelRouter):
...   @classmethod
...   def get_register_class_map(cls):
...     mapping = super().get_register_class_map()
...     mapping[SingleObjectMixin, MultipleObjectMixin] = (
...       GenericModelViewRoute.make_for_view
...     )
...     return mapping

>>> GenericModelRouter.register_class(
...   ListView, map_kwargs={'index': True}
... ) is not None
True
>>> GenericModelRouter.register_class(DetailView) is not None
True
>>> GenericModelRouter.register_class(CreateView) is not None
True
>>> GenericModelRouter.register_class(UpdateView) is not None
True
>>> GenericModelRouter.register_class(DeleteView) is not None
True

>>> router = GenericModelRouter(TestModel)

>>> print(router.get_str_tree())
...
 - GenericModelRouter testmodel @ ^testmodel/
   - testmodel-list-redirect @ ^$ RedirectView
   - testmodel-list @ ^list$ ListView
   - testmodel-detail @ ^detail/(?P<pk>\d+)$ DetailView
   - testmodel-detail @ ^detail/(?P<slug>[\w-]+)$ DetailView
   - testmodel-create @ ^create$ CreateView
   - testmodel-update @ ^update/(?P<pk>\d+)$ UpdateView
   - testmodel-update @ ^update/(?P<slug>[\w-]+)$ UpdateView
   - testmodel-delete @ ^delete/(?P<pk>\d+)$ DeleteView
   - testmodel-delete @ ^delete/(?P<slug>[\w-]+)$ DeleteView

>>> list(router.patterns())
[<RegexURLResolver <RegexURLPattern list> (None:None) ^testmodel/>]
```

2.7 Quick routes and routers reference

These two tables show the objects used the most frequently in django-crucrudile.

Note: There are many other classes though, as functionality is splitted into specific classes and mixins. For more information, see the *Reference*.

2.7.1 Routers

Note: These classes are stored in the `routers` module. For more information, see `django_crucrudile.routers`

Router class	Mixins	Description
`Router`	None	Base router, is a container for other routers and routes.
`ModelRouter`	`ModelMixin`	Model router, passes model when instantiating routed entities

2.7.2 Routes

Note: These classes are stored in the `routes` module. For more information, see `django_crucrudile.routes`.

Router class	Mixins	Description
`CallbackRoute`	• `ArgumentsMixin` • `CallbackMixin`	Route that points to a given callback
`ViewRoute`	• `ArgumentsMixin` • `ViewMixin`	Route that points to a callback obtained from a given view class
`ModelViewRoute`	• `ArgumentsMixin` • `ModelMixin` • `ViewMixin`	Route that points to a callback obtained from a given view class obtained, and that uses a given model class
`GenericModelViewRoute`	• `ArgumentsMixin` • `ModelMixin` • `ViewMixin` • `GenericViewArgsMixin`	Same as `ModelViewRoute`, but guesses URL arguments from the class, that should be a Django generic view.

2.8 More examples

2.8.1 Bookstore example

Bookstore example, with three simple models.

```
>>> # these two lines are required to subclass Django model in doctests
>>> import tests.unit
>>> __name__ = "tests.doctests"

>>> from django.db.models import Model
>>> from django_crucrudile.routers import Router, ModelRouter
>>>
>>>
>>> class Book(Model):
...   pass
>>>
>>> class Author(Model):
...   pass
>>>
>>> class Editor(Model):
...   pass

>>> router = Router(generic=True)
>>>
>>> router.register(Author, index=True) is not None
True
>>> router.register(Book) is not None
True
>>> router.register(Editor) is not None
True

>>> print(router.get_str_tree())
...
 - Router  @ ^
   - author-list-redirect @ ^$ RedirectView
   - GenericModelRouter author @ ^author/
     - author-list-redirect @ ^$ RedirectView
     - author-delete @ ^delete/(?P<pk>\d+)$ DeleteView
     - author-delete @ ^delete/(?P<slug>[\w-]+)$ DeleteView
     - author-update @ ^update/(?P<pk>\d+)$ UpdateView
     - author-update @ ^update/(?P<slug>[\w-]+)$ UpdateView
     - author-create @ ^create$ CreateView
     - author-detail @ ^detail/(?P<pk>\d+)$ DetailView
     - author-detail @ ^detail/(?P<slug>[\w-]+)$ DetailView
     - author-list @ ^list$ ListView
   - GenericModelRouter book @ ^book/
     - book-list-redirect @ ^$ RedirectView
     - book-delete @ ^delete/(?P<pk>\d+)$ DeleteView
     - book-delete @ ^delete/(?P<slug>[\w-]+)$ DeleteView
     - book-update @ ^update/(?P<pk>\d+)$ UpdateView
     - book-update @ ^update/(?P<slug>[\w-]+)$ UpdateView
     - book-create @ ^create$ CreateView
     - book-detail @ ^detail/(?P<pk>\d+)$ DetailView
     - book-detail @ ^detail/(?P<slug>[\w-]+)$ DetailView
     - book-list @ ^list$ ListView
   - GenericModelRouter editor @ ^editor/
     - editor-list-redirect @ ^$ RedirectView
     - editor-delete @ ^delete/(?P<pk>\d+)$ DeleteView
     - editor-delete @ ^delete/(?P<slug>[\w-]+)$ DeleteView
     - editor-update @ ^update/(?P<pk>\d+)$ UpdateView
     - editor-update @ ^update/(?P<slug>[\w-]+)$ UpdateView
     - editor-create @ ^create$ CreateView
     - editor-detail @ ^detail/(?P<pk>\d+)$ DetailView
```

```
  - editor-detail @ ^detail/(?P<slug>[\w-]+)$ DetailView
  - editor-list @ ^list$ ListView
```

CHAPTER 3

Reference

3.1 Routes and route mixins

Contents

A route is an implementation of the `django_crucrudile.entities.Entity` abstract class that yields URL patterns made from its attributes. In the code, this is represented by subclassing `django_crucrudile.entities.Entity` and providing a generator in `patterns()`, yielding URL patterns made from the route attributes. When route classes provide `django_crucrudile.entities.Entity.patterns()`, it makes them become concrete implementations of the Entity abstract class. Route classes themselves are abstract by nature and need a definition of the abstract function `base.BaseRoute.get_callback()`.

- `CallbackRoute` : Implements `base.BaseRoute` using `mixins.callback.CallbackMixin` that provides an implementation of `base.BaseRoute.get_callback()` that returns the callback set on the route (either in `CallbackRoute.__init__()` or as class attribute)
- `ViewRoute` : Implements `base.BaseRoute` using `mixins.view.ViewMixin` that provides an implementation of `base.BaseRoute.get_callback()` that returns the a callback obtaining from the view class set on the route (either in `mixins.view.ViewMixin.__init__()` or as class attribute).
- `ModelViewRoute` : Implements `base.BaseRoute` using `mixins.view.ViewMixin` and `mixins.model.ModelMixin`, passes the model in the view keyword arguments, and can be used with Django generic views.

Note: `ModelViewRoute` Can also be used in a `django_crucrudile.routers.model.ModelRouter` store register mapping, as it correctly uses the model given in `django_crucrudile.routers.mixins.model.ModelMixin.` and `django_crucrudile.routers.mixins.model.ModelMixin.get_base_store_kwargs`, and the view class that can then be registered in the resulting router.

3.1.1 Base route

This module contains the "main" abstract route class, that provides `BaseRoute.patterns()`, yielding patterns made from the route metadata and using the callback returned by implementations of the abstract function `BaseRoute.get_callback()`.

Note: This route class is one the two (along with `django_crucrudile.routers.Router`) standard implementations of the `django_crucrudile.entities.Entity` abstract class.

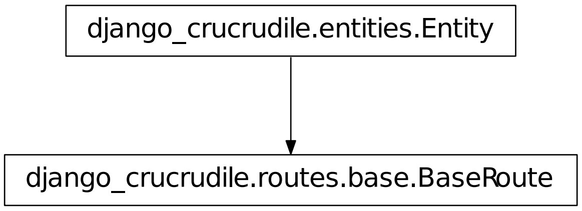
class `django_crucrudile.routes.base.`**`BaseRoute`**(*name=None*, *url_part=None*, ***kwargs*)

Bases: `django_crucrudile.entities.Entity`

Abstract class for a `django_crucrudile.entities.Entity` that URL patterns that point to its implementation of `get_callback()`. Implements `django_crucrudile.entities.Entity.patterns()` using `patterns()`.

Warning: Abstract class ! Subclasses should define the `get_callback()` function. See warning in `__init__()`.

The URL part and URL name must be either set on class, or given at `__init__()`.


django_crucrudile.entities.Entity
django_crucrudile.routes.base.BaseRoute

`auto_url_part` = **True**

Attribute auto_url_part Automatically set `url_part` to `name` if none defined.

`__init__`(*name=None*, *url_part=None*, ***kwargs*)

Initialize Route, check that needed attributes/arguments are defined.

Also sets `self.redirect` to the URL name (using `get_url_name()`).

Parameters

- **name** – See `name`
- **url_part** – See `url_part`

Raises

- **ValueError** – If `name` is `None`, and not given in args
- **ValueError** – If `url_part` is `None`, and not given in args, and `auto_url_part` is `None` or `name` is `None`
- **TypeError** – If `get_callback()` not implemented (see warning below)

Warning: This method cannot be called on `BaseRoute`, as it is an abstract class missing an implementation of `get_callback()` :

```
>>> try:
...     BaseRoute()
... except Exception as catched:
...     type(catched).__name__
...     str(catched) == (
...         "Can't instantiate abstract class BaseRoute "
...         "with abstract methods get_callback"
...     )
'TypeError'
True
```

`name` = None

Attribute name URL name to use for this pattern (will be used for the Django URL pattern name)

`url_part` = None

Attribute url_part URL regex to use for the pattern (will be used in the URL regexp)

`patterns`(*parents=None*, *add_redirect=None*, *add_redirect_silent=None*)

Yield patterns for URL regexs in `get_url_regexs()`, using callback in `get_callback()` and URL name from `get_url_name()`.

Parameters

- **parents** (list of `django_crucrudile.routers.Router`) – Not used in `BaseRoute`'s implementation of `patterns`.
- **add_redirect** (*bool*) – Not used in `BaseRoute`'s implementation of `patterns`.
- **add_redirect_silent** (*bool*) – Not used in `BaseRoute`'s implementation of `patterns`.

Returns Django URL patterns

Return type iterable of `RegexURLPattern`

```
>>> class Route(BaseRoute):
...   def get_callback(self):
...     pass
>>>
>>> route = Route('name', 'url_part')
>>> list(route.patterns())
[<RegexURLPattern name ^url_part$>]
```

`get_callback`()

Return callback to use in the URL pattern

Warning: Abstract method ! Should be implemented in subclasses, otherwise class instantiation will fail. See warning in `__init__()`.

Returns Callable to use in the URL patter

Return type callable

get_url_name()
Get the main URL name, defined at class level (name) or passed to __init__().

Returns main URL name

Return type str

```
>>> class Route(BaseRoute):
...   def get_callback(self):
...    pass
>>>
>>> route = Route('name', 'url_part')
>>> route.get_url_name()
'name'
```

get_url_names()
Get a list of URL names to generate patterns for. An least one URL pattern will be returned for each URL name returned by this function.

The default implementation returns a singleton (get_url_name()).

Returns URL names (list of URL name)

Return type iterable of str

```
>>> class Route(BaseRoute):
...   def get_callback(self):
...    pass
>>>
>>> route = Route('name', 'url_part')
>>> print(list(route.get_url_names()))
['name']
```

get_url_part()
Get the main URL part, defined at class level (url_part) or passed to __init__().

Returns main URL part

Return type str

```
>>> class Route(BaseRoute):
...   def get_callback(self):
...    pass
>>>
>>> route = Route('name', 'url_part')
>>> route.get_url_part()
'url_part'
```

get_url_parts()
Get a list of URL parts to generate patterns for. At least one URL pattern will be returned for each URL part returned by this function.

The default implementation returns a singleton (get_url_part()).

Returns URL parts (list of URL part)

Return type iterable of str

```
>>> class Route(BaseRoute):
...   def get_callback(self):
...    pass
>>>
>>> route = Route('name', 'url_part')
>>> list(route.get_url_parts())
['url_part']
```

get_url_specs()

Yield URL specifications. An URL specification is a 3-tuple, containing 3 `django_crucrudile.urlutils.URLBuilder` instances : `prefix`, `name` and `suffix`. These objects are used to join together different part of the URLs. Using them in a 3-tuple allows building an URL part with a "central" name, (whose parts are joined using `-`), a prefix (joined using `/`), and a suffix (joined using `/`, `/?`). This schema allows different subclasses to register different parts in the URLs (without interfering with each other, using `super()`), and provides automatic optional/required separator handling.

The base implementation yields a specification for each URL part returned by `get_url_parts()`.

Note: The `prefix`, `name` and `suffix` names for the URL specification contents are purely indicative, and never used as identifiers. They are used in this package's code for consistency.

Returns URL specifications

Return type iterable of 3-tuple

```
>>> class Route(BaseRoute):
...   def get_callback(self):
...    pass
>>>
>>> route = Route('name', 'url_part')
>>> list(route.get_url_specs())
[([], ['url_part'], [])]
```

get_url_regexs()

Yield URL regexs to generate patterns for.

For each URL specification in `get_url_specs()` :

- Run each `django_crucrudile.urlutils.URLBuilder` instance in the URL specification 3-tuple (`prefix`, `name` and `suffix`)
- Pass builder outputs in another URL builder
- Run this builder, and yield output, prefixed with '^' and suffixed with '$'

URL specifications are structured as follow :

- iterable (list of
- iterable (3-tuple) of
- iterable (URLBuilder) of
- URL part

We use `django_crucrudile.urlutils.URLBuilder` twice, first to join the URL parts in each URL builder of the specification (`prefix`, `name` and `suffix`), and then to join together the 3 resulting URL parts.

It's not possible to flatten this list directly, because `prefix`, `name` and `suffix` may use different separators.

Returns URL regexs

Return type iterable of string

```
>>> class Route(BaseRoute):
...   def get_callback(self):
...    pass
>>>
>>> route = Route('name', 'url_part')
>>> list(route.get_url_regexs())
['^url_part$']
```

3.1.2 Route mixins

This module contains route mixins, that implement specific functionality for abstract class `django_crucrudile.routes.base.BaseRoute()` subclasses. Some of these mixins make the class "concrete" (as the abstract function `django_crucrudile.routes.base.BaseRoute.get_callback()` is implemented, the class can be instantiated).

Abstract

Arguments

This module contains the `ArgumentsMixin` route mixin, that uses `parser.ArgumentsParser` to create a list of argument combinations from the given argument list.

class `django_crucrudile.routes.mixins.arguments.`**`ArgumentsMixin`**(**args, arguments_spec=None, **kwargs*)

Bases: `builtins.object`

Route mixin, that builds the argument combination list when instantiating, and that yields (in `get_url_specs()`) another URL specification for each argument in resulting list.

Should be a list that, if needed, contains argument specifications. An argument specification is a 2-tuple, contaning a boolean indicating if the argument is required or not,

Warning: This mixin does not make `django_crucrudile.routes.base.BaseRoute` a concrete class !

`arguments_parser`

Attribute arguments_parser Argument parser to use to build the argument combinations from the argument specifications. Should be a `django_crucrudile.urlutils.Parsable` subclass, or any class whose instances can be called to return its parsed output.

alias of `ArgumentsParser`

`__init__`(**args*, *arguments_spec=None*, ***kwargs*)
Initialize route, set arguments specification if given, and run arguments parser.

Parameters **arguments_spec** – See `arguments_spec`

Example with the default test parser (`parser.ArgumentsParser`) used with `base.BaseRoute` :

```
>>> from django_crucrudile.routes.base import BaseRoute
>>>
>>> class ArgumentsRoute(ArgumentsMixin, BaseRoute):
...   def get_callback(self):
...     pass
>>>
>>> route = ArgumentsRoute(
...   'name', 'url_part',
...   arguments_spec=[
...     ['<arg1.1>', '<arg1.2>'],
...     '<arg2>'
...   ]
... )
>>>
>>> list(route.get_url_regexs())
...
['^url_part/<arg1.1>/<arg2>$',
 '^url_part/<arg1.2>/<arg2>$']
```

`arguments_spec` = **None**

Attribute arguments_spec Argument list that will be passed to `arguments_parser`. Should be structured as the arguments parser expects it.

`get_arguments_spec`()
Yield argument specifications. By default, return specifications from `arguments_spec`. Subclasses or mixins may override this method to add their own argument specifications.

Returns Argument specifications

Return type iterable

```
>>> list(ArgumentsMixin().get_arguments_spec())
[]
```

`get_url_specs`()
Yield another URL specification for each argument in the argument combination list (arguments parser output).

Returns URL specifications

Return type iterable of 3-tuple

Example using the default test parser (`parser.ArgumentsParser`) :

```
>>> from django_crucrudile.routes.base import BaseRoute
>>>
>>> class ArgumentsRoute(ArgumentsMixin, BaseRoute):
...   def get_callback(self):
...     pass
...   arguments_spec=[
...     ['<arg1.1>', '<arg1.2>'],
...     '<arg2>'
...   ]
>>>
>>> route = ArgumentsRoute(
...   'name', 'url_part',
... )
>>>
>>> list(route.get_url_specs())
...
[([],
  ['url_part'],
  [(True, '<arg1.1>/<arg2>')]),
 ([],
  ['url_part'],
  [(True, '<arg1.2>/<arg2>')])]
```

Parser This module contains the default arguments parser (`ArgumentsParser`), used in `django_crucrudile.routes.mixins.arguments.ArgumentsMixin`.

The `combine()` function is used by the cartesian product in `ArgumentsParser.cartesian_product()`, it joins an iterable (filtering out its items that evaluate to `None`) using a given separator.

`django_crucrudile.routes.mixins.arguments.parser.`**`combine`**`(`*iterable*, *separator*`)`

Join `iterable` (filtering out its items that evaluate to `one`) using `separator`

Parameters

- **iterable** (*iterable*) – Iterable to filter and join
- **separator** (*str*) – Separator to join with

Returns Joined string

Return type str

```
>>> combine(['Foo', '', 'Bar', None, 'Xyz', 0], '/')
'Foo/Bar/Xyz'
```

class `django_crucrudile.routes.mixins.arguments.parser.`**`ArgumentsParser`**`(`*iterable=None*, *separator=None*, *opt_separator=None*, *required_default=None*`)`

Bases: `django_crucrudile.urlutils.OptionalPartList`

This parser reads a list of argument specification, and builds an argument combination list (using a cartesian product). It subclasses `django_crucrudile.urlutils.OptionalPartList` (as an arguments list is an URL part list), and add its building parsers in `ArgumentsParser.get_parsers()`.

The input of the parser should be a list of argument specifications. Argument specifications can be written as :

- `(bool, string)` : converted to `(bool, list([string]))`
- `string` : converted to `(True, list([string]))`
- `list` : converted to `(True, list)`

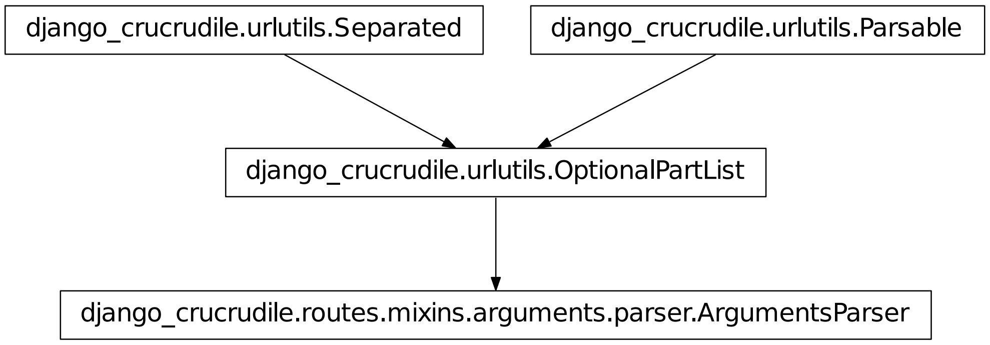
If `bool` is not defined, a default value will be used (see `django_crucrudile.urlutils.Separated.required_defa`

In `(bool, list)` :

- `bool` is a boolean flag indicating whether an argument list is required
- `list` is a list of argument, as "choices" : a combination will be generated for each item in the list

The output of the parser is a list of 2-tuple containing a boolean value and a string. The boolean value is a flag indicating whether the first argument of the string is required, and the string is the joined URL parts of the argument combination.

To set the separators, see `django_crucrudile.urlutils.Separated.separator` and `django_crucrudile.urlutils.Separated.opt_separator`.


django_crucrudile.urlutils.Separated
django_crucrudile.urlutils.Parsable
django_crucrudile.urlutils.OptionalPartList
django_crucrudile.routes.mixins.arguments.parser.ArgumentsParser

With empty specifition (o

```
>>> parser = ArgumentsParser([])
>>>
>>> parser() == ArgumentsParser()()
True
>>>
>>> parser()
...
[]
```

With single item :

```
>>> parser = ArgumentsParser(["<my>/<arg>/<spec>"])
>>> list(parser())
...
[(True, '<my>/<arg>/<spec>')]
```

With first argument **required** :

```
>>> parser = ArgumentsParser([
...     ["<arg1.1>", "<arg2.2>"],
...     "<arg3>",
...     (False, ["<arg4.1>", "<arg4.2>"]),
...     (True, ["<args5>"])
... ])
>>>
>>> parser()
...
[(True, '<arg1.1>/<arg3>/?<arg4.1>/<args5>'),
 (True, '<arg1.1>/<arg3>/?<arg4.2>/<args5>'),
 (True, '<arg2.2>/<arg3>/?<arg4.1>/<args5>'),
 (True, '<arg2.2>/<arg3>/?<arg4.2>/<args5>')]
```

get_parsers()

Add `transform_args_to_list()`, `cartesian_product()` and `consume_cartesian_product()` to the parsers from `django_crucrudile.urlutils.OptionalPartList`

Returns Argument parsers list

Return type list of callable

static transform_args_to_list(*items*)

Transform second part of each item in items in a list if it's not one.

Parameters items (*iterable of 2-tuple*) – List of items to transform

Returns Transformed list

Return type iterable of 2-tuple : [(bool, list)]

```
>>> list(ArgumentsParser.transform_args_to_list([
...    (None, '<arg1>'),
...    (None, ['<arg2>', '<arg3>'])
... ]))
...
[(None, ['<arg1>']),
 (None, ['<arg2>', '<arg3>'])]
```

static cartesian_product(*items*, *get_separator*)

Process cartesian product to get all possible combinations with argument lists in `items`.

Parameters items (*iterable of 2-tuple*) – List of tuple to transform (2-tuple with a flag indicating if the argument specification is required, and the argument choice list)

Returns List of 2-tuple, with a flag indicating if the first item is required, and the joined list.

Return type iterable of 2-tuple : [(bool, str)]

```
>>> get_separator = lambda x: '/' if x else '/?'
```

With first spec **required** :

```
>>> list(ArgumentsParser.cartesian_product(
...    [
...      (True, ['<arg1>']),
...      (True, ['<arg2>', '<arg3>']),
...      (False, ['<arg4>', '<arg5>'])
...    ],
...     get_separator=get_separator
... ))
...
[(True, '<arg1>/<arg2>/?<arg4>'),
 (True, '<arg1>/<arg2>/?<arg5>'),
 (True, '<arg1>/<arg3>/?<arg4>'),
 (True, '<arg1>/<arg3>/?<arg5>')]
```

With first spec **not required** :

```
>>> list(ArgumentsParser.cartesian_product(
...    [
...      (False, ['<arg1>']),
...      (True, ['<arg2>', '<arg3>']),
...      (False, ['<arg4>', '<arg5>'])
...    ],
...    get_separator=get_separator
... ))
...
[(False, '<arg1>/<arg2>/?<arg4>'),
 (False, '<arg1>/<arg2>/?<arg5>'),
 (False, '<arg1>/<arg3>/?<arg4>'),
 (False, '<arg1>/<arg3>/?<arg5>')]
```

static `consume_cartesian_product` (*items*)

Force the generated to be consumed

Parameters **items** (*iterable*) – Generator to consume

Returns Consumed list

Return type list

```
>>> ArgumentsParser.consume_cartesian_product(iter([1]))
[1]
```

Model

This module contains `ModelMixin`, a route mixin that can be used to bind a model to a route, and use it when computing route metadata.

class `django_crucrudile.routes.mixins.model.`**`ModelMixin`**(**args*, *model=None*, *prefix_url_part=None*, ***kwargs*)

Bases: `builtins.object`

Route mixin that requires a model to be set either on the class (`model` attribute), or to be passed in `__init__()`, and provides the URL name and URL part using the model metadata.

Warning: This mixin does not make `django_crucrudile.routes.base.BaseRoute` a concrete class !

`__init__`(**args*, *model=None*, *prefix_url_part=None*, ***kwargs*)

Initialize ModelRoute, check that model is defined at class-level or passed as argument.

Parameters

- **model** – See `model`
- **prefix_url_part** – See `prefix_url_part`

Raises ValueError `model` argument is None, and no model defined in `model`

`model` = None

Attribute model Model to use on the Route

prefix_url_part = False

Attribute prefix_url_part Prefix the URL part with the model (ex: `/model/<url_part>`)

model_url_name

Return the model name to be used when building the URL name

Returns URL name from model name, using Django internals

Return type str

```
>>> from django_crucrudile.routes.base import BaseRoute
>>> from mock import Mock
>>>
>>> class ModelRoute(ModelMixin, BaseRoute):
...   def get_callback(self):
...     pass
>>>
>>> model = Mock()
>>> model._meta.model_name = 'testmodel'
>>> route = ModelRoute(model=model, name='routename')
>>>
>>> route.model_url_name
'testmodel'
```

model_url_part

Return the model name to be used when building the URL part

Returns URL part from the URL name (`model_url_name()`)

Return type str

```
>>> from django_crucrudile.routes.base import BaseRoute
>>> from mock import Mock
>>>
>>> model = Mock()
>>> model._meta.model_name = 'testmodel'
>>> route = ModelMixin(model=model)
>>>
>>> route.model_url_part
'testmodel'
```

get_url_specs()

Return URL specs where the model URL name is appended to the prefix part list if needed

Returns URL specifications

Return type iterable of 3-tuple

```
>>> from django_crucrudile.routes.base import BaseRoute
>>> from mock import Mock
>>>
>>> class ModelRoute(ModelMixin, BaseRoute):
...   def get_callback(self):
...     pass
>>>
>>> model = Mock()
>>> model._meta.model_name = 'testmodel'
>>> route = ModelRoute(model=model, name='routename')
>>>
```

```
>>> list(route.get_url_specs())
[([], ['routename'], [])]
```

With `prefix_url_part` set to `True` :

```
>>> from django_crucrudile.routes.base import BaseRoute
>>> from mock import Mock
>>>
>>> class PrefixModelRoute(ModelMixin, BaseRoute):
...   def get_callback(self):
...     pass
...   prefix_url_part = True
>>>
>>> model = Mock()
>>> model._meta.model_name = 'testmodel'
>>> route = PrefixModelRoute(
...     model=model, name='routename',
... )
>>>
>>> list(route.get_url_specs())
...
[(['testmodel'],
  ['routename'],
  [])]
```

`get_url_name``()`

Return the URL name built `model_url_name()` and `Route.name`.

Returns compiled URL name

Return type str

```
>>> from django_crucrudile.routes.base import BaseRoute
>>> from mock import Mock
>>>
>>> class ModelRoute(ModelMixin, BaseRoute):
...   def get_callback(self):
...     pass
>>>
>>> model = Mock()
>>> model._meta.model_name = 'testmodel'
>>> route = ModelRoute(
...     model=model, name='routename',
... )
>>>
>>> route.get_url_name()
'testmodel-routename'
```

class `django_crucrudile.routes.mixins.model.`**`GenericViewArgsMixin`**

Bases: `builtins.object`

This route mixin, that should be used with `django_crucrudile.routes.mixins.arguments.ArgumentsMixin` and `django_crucrudile.routes.mixins.view.ViewMixin`, enables automatic URL arguments for Django generic views.

`get_arguments_spec``()`

Add view arguments (returned by `get_view_arguments()`) to the arguments specification returned by the super implementation (`django_crucrudile.routes.mixins.arguments.ArgumentsMixin.get_arguments_spec()`).

Returns Arguments specification

Return type iterable

get_view_arguments()

Return URL arguments if the view class is a Django generic view that requires an URL argument for the object.

Returns View argument specification

Return type iterable

Generic view arguments

This module contains `GenericViewArgsMixin`, a route mixin that can be used to automatically get the needed URL arguments for a Django generic view.

class `django_crucrudile.routes.mixins.model.generic.`**GenericViewArgsMixin**

Bases: `builtins.object`

This route mixin, that should be used with `django_crucrudile.routes.mixins.arguments.ArgumentsMixin` and `django_crucrudile.routes.mixins.view.ViewMixin`, enables automatic URL arguments for Django generic views.

get_view_arguments()

Return URL arguments if the view class is a Django generic view that requires an URL argument for the object.

Returns View argument specification

Return type iterable

get_arguments_spec()

Add view arguments (returned by `get_view_arguments()`) to the arguments specification returned by the super implementation (`django_crucrudile.routes.mixins.arguments.ArgumentsMixin.get_arguments_spec()`).

Returns Arguments specification

Return type iterable

Concrete

Callback

This module contains a route mixin, `CallbackMixin`, that implements `django_crucrudile.routes.base.BaseRoute`.

class `django_crucrudile.routes.mixins.callback.`**CallbackMixin**(**args*, *callback=None*, ***kwargs*)

Bases: `builtins.object`

Route mixin, implements `django_crucrudile.routes.base.BaseRoute`, requires a callback to be set either on the class (`callback` attribute), or to be passed in `__init__()`.

Note: This mixin makes the class concrete, as it implements the `django_crucrudile.routes.base.BaseRoute.get_callback()` abstract function.

`__init__`(**args*, *callback=None*, ***kwargs*)
Initialize CallbackRoute, check that callback is defined at class-level or passed as argument

Parameters **callback** – See `callback`

Raises ValueError If `callback` and `callback` are both `None`

`callback` = **None**

Attribute callback Callback that will be used by the URL pattern

`get_callback`()
Return `callback`

Returns The callback set on class (`callback`) or passed to `__init__()`.

Return type callable

View

This module contains a route mixin, `ViewMixin`, that implements `django_crucrudile.routes.base.BaseRoute`.

class `django_crucrudile.routes.mixins.view.`**`ViewMixin`**(*view_class=None*, *name=None*, *auto_url_name_from_view=None*, **args*, ***kwargs*)
Bases: `builtins.object`

Route mixin, implements `django_crucrudile.routes.base.BaseRoute`, requires a view class to be set either on the class (`callback` attribute), or to be passed in `__init__()`.

The view class will be used to get the callback to give to the URL pattern.

Note: This mixin makes the class concrete, as it implements the `django_crucrudile.routes.base.BaseRoute.get_callback()` abstract function.

```
>>> class TestView:
...   pass
>>>
>>> route = ViewMixin(TestView)
```

```
>>>
>>> route.view_class.__name__
'TestView'
>>> route.name
'test'
```

With `auto_url_name_from_view` set to `False` :

```
>>> class TestView:
...   pass
>>>
>>> route = ViewMixin(TestView, auto_url_name_from_view=False)
>>>
>>> route.view_class.__name__
'TestView'
>>>
>>> # Because :class:`ViewMixin` does not even set
>>> # :attr:`django_crucrudile.routes.base.BaseRoute.name` if
>>> # :attr:`auto_url_name_from_view` is ``False``, this will
>>> # raise an attribute error :
>>> route.name
Traceback (most recent call last):
  ...
AttributeError: 'ViewMixin' object has no attribute 'name'
```

`__init__`(*view_class=None*, *name=None*, *auto_url_name_from_view=None*, **args*, ***kwargs*)
Initialize ViewRoute, check that view_class is defined at class-level or passed as argument.

Parameters

- **view_class** – See `view_class`
- **auto_url_name_from_view** – See `auto_url_name_from_view`

See also:

For doctests that use this member, see `ViewMixin`

Raises ValueError if both `view_class` and `view_class` are None

`view_class` = None

Attribute view_class View class that will be used to get the callback to pass to the URL pattern

`auto_url_name_from_view` = True

Attribute auto_url_name_from_view Automatically set route name using view class name (lower casing it, and stripping it of `View`)

`get_callback`()
Return callback using `django.generic.views.View.as_view()`, getting arguments from `get_view_kwargs()`.

Calls `View.as_view()` on view class, with kwargs from `get_view_kwargs()`, to get callback to use in URL pattern.

Returns Callback to use in URL pattern

Return type callable

```
>>> from mock import Mock
>>> callback = Mock()
>>> mock_view = Mock()
>>> mock_view.__name__ = 'MockView'
>>> mock_view.as_view = lambda: callback
>>>
>>> route = ViewMixin(view_class=mock_view)
>>> route.get_callback() is callback
True
```

`get_view_kwargs`()
Return arguments to use when calling the callback builder.

Returns Keyword arguments

Return type dict

classmethod `make_for_view`(*view_class*, ***kwargs*)
Return a subclass of this class, setting the `view_class` argument at class-level.

Also sets the `django_crucrudile.routes.base.BaseRoute.name` attribute using the view class name.

This is useful when combined with `django_crucrudile.entities.store.EntityStore.register_class` as it only accepts classes (in opposition to `django_crucrudile.entities.store.EntityStore.register()`

Parameters **view_class** (subclass of `django.views.generic.view`) – View class to set on the resulting class

Returns New class, with `view_class` attribute set to `view_class` argument.

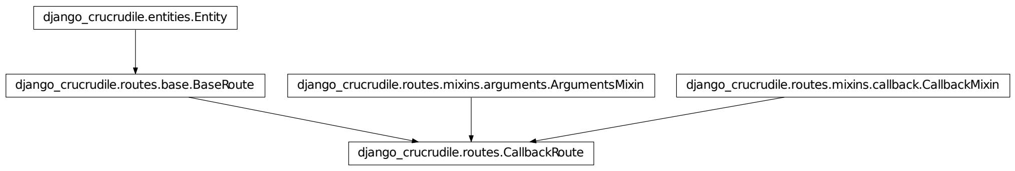
```
>>> class TestView:
...   pass
>>>
>>> route_class = ViewMixin.make_for_view(TestView)
>>>
>>> route_class.__name__
'TestRoute'
>>> route_class.view_class.__name__
'TestView'
```

3.1.3 Callback route

class `django_crucrudile.routes.`**`CallbackRoute`**(**args*, ***kwargs*)
Bases: `django_crucrudile.routes.mixins.arguments.ArgumentsMixin`, `django_crucrudile.routes.mixins.callback.CallbackMixin`, `django_crucrudile.routes.base.BaseRoute`

Implement `base.BaseRoute` using a callback function.

Also use `mixins.arguments.ArgumentsMixin` to allow URL arguments to be specified.


django_crucrudile.entities.Entity
django_crucrudile.routes.base.BaseRoute
django_crucrudile.routes.mixins.arguments.ArgumentsMixin
django_crucrudile.routes.mixins.callback.CallbackMixin
django_crucrudile.routes.CallbackRoute

`__init__`(**args*, ***kwargs*)
Initialize CallbackRoute, for a description of arguments see :

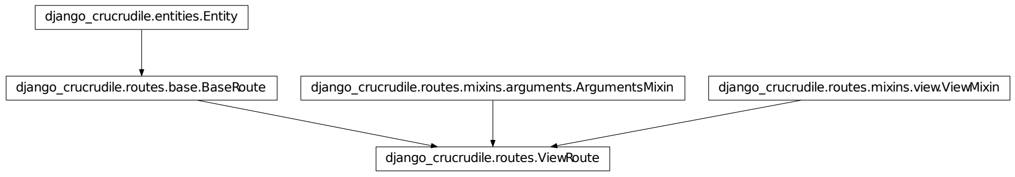
- `mixins.arguments.ArgumentsMixin.__init__()`
- `mixins.callback.CallbackMixin.__init__()`
- `base.BaseRoute.__init__()`

3.1.4 View route

class `django_crucrudile.routes.`**`ViewRoute`**(**args*, ***kwargs*)
Bases: `django_crucrudile.routes.mixins.arguments.ArgumentsMixin`, `django_crucrudile.routes.mixins.view.ViewMixin`, `django_crucrudile.routes.base.BaseRoute`

Implement `base.BaseRoute` using a view class function.

Also use `mixins.arguments.ArgumentsMixin` to allow URL arguments to be specified.


django_crucrudile.entities.Entity
django_crucrudile.routes.base.BaseRoute
django_crucrudile.routes.mixins.arguments.ArgumentsMixin
django_crucrudile.routes.mixins.view.ViewMixin
django_crucrudile.routes.ViewRoute

`__init__`(**args*, ***kwargs*)
Initialize ViewRoute, for a description of arguments see :

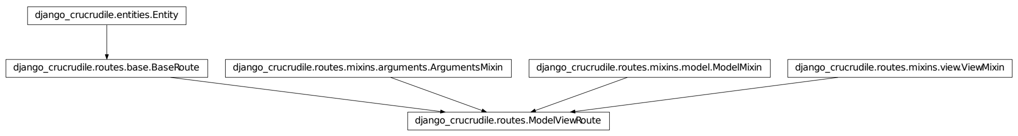
- `mixins.arguments.ArgumentsMixin.__init__()`
- `mixins.view.ViewMixin.__init__()`
- `base.BaseRoute.__init__()`

3.1.5 Model view route

class `django_crucrudile.routes.`**`ModelViewRoute`**(**args*, ***kwargs*)
Bases: `django_crucrudile.routes.mixins.arguments.ArgumentsMixin`, `django_crucrudile.routes.mixins.model.ModelMixin`, `django_crucrudile.routes.mixins.view.V`
`django_crucrudile.routes.base.BaseRoute`

Combine `mixins.view.ViewMixin` and `django_crucrudile.routes.mixins.model.ModelMixin` to make a route that can easily be used with a model and a generic view.

Also use `mixins.arguments.ArgumentsMixin` to allow URL arguments to be specified.



django_crucrudile.entities.Entity
django_crucrudile.routes.base.BaseRoute
django_crucrudile.routes.mixins.arguments.ArgumentsMixin
django_crucrudile.routes.mixins.model.ModelMixin
django_crucrudile.routes.mixins.view.ViewMixin
django_crucrudile.routes.ModelViewRoute

`__init__`(**args*, ***kwargs*)

Initialize ModelViewRoute, for a description of arguments see :

- `mixins.arguments.ArgumentsMixin.__init__()`
- `mixins.model.ModelMixin.__init__()`
- `mixins.view.ViewMixin.__init__()`
- `base.BaseRoute.__init__()`

`get_view_kwargs`()

Make the view use `mixins.model.ModelMixin.model`.

This is the effective combination of `mixins.model.ModelMixin` and `ViewRoute`.

```
>>> from mock import Mock
>>>
>>> model = Mock()
>>> route = ModelViewRoute(model=model, view_class=Mock(),name='name')
>>>
>>> route.get_view_kwargs()['model'] is model
True
```

3.1.6 Generic model view route

class `django_crucrudile.routes.`**`GenericModelViewRoute`**(**args*, ***kwargs*)

Bases: `django_crucrudile.routes.mixins.model.generic.GenericViewArgsMixin`, `django_crucrudile.routes.ModelViewRoute`

Combine `ModelViewRoute` with `django_crucrudile.routes.mixins.model.generic.GenericViewArgsM` to automatically get the needed URL arguments for route instances.

3.2 Entity store and decorators

Contents

The entity store class provides functions to register entity instances in an entity store.

It also allow entity classes to be registered at class-level in a "base store". These entity classes will be instantiated when the entity store gets instantiated, and the resulting instances will be registered.

It also allows "register mappings" to be defined, they allow objects passed to register functions to be transformed based on a mapping. When looking for a mapping, register functions will compare their argument to the mapping key (using `issubclass`, or `isinstance`), and use the corresponding mapping value to get the object that will be registered.

Additionally, register mapping keys can be iterables (list or tuples), in which case the register functions will compare their argument to any of the elements in the mapping key, and match even if only a single item in the mapping key matches the argument.

The base store is copied on each class definition, using a metaclass, so that using register functions that class-level won't alter the base store of other class definitions.

This module also contains a `provides()` decorator, that decorates a entity store class, adding an object to its base store.

Doctests that use functionality in `EntityStore` can be seen in other classes (in particular `django_crucrudile.routers.Router`). They may help to get a good idea of what the entity, entity store and entity graph concepts mean.

3.2.1 Decorators

`django_crucrudile.entities.store.`**`provides`**(*provided*, ***kwargs*)

Return a decorator that uses `EntityStore.register_class()` to register the given object in the base store.

Parameters **provided** (*object*) – Class (or object) to register in the base store. This can be an object since it may be transformed by `EntityStore.register_apply_map()`

3.2.2 Entity store

class `django_crucrudile.entities.store.`**`BaseStoreMetaclassMixin`**(*name*, *bases*, *attrs*)

Bases: `builtins.type`

Allows `EntityStore` to use different `_base_register_map` and `_base_register_map` class-level mappings (list instance) for each class definitions. (`cls` instantiation)

```
>>> class Store(metaclass=BaseStoreMetaclassMixin):
...   pass
>>>
>>> class FailStore:
...   _fail_store = []
>>>
>>> class NewStore(Store):
...   pass
```

```
>>>
>>> class FailNewStore(FailStore):
...   pass

>>> (NewStore._base_register_map is
...  Store._base_register_map)
False
>>> (NewStore._base_register_class_map is
...  Store._base_register_class_map)
False

>>> (FailNewStore._fail_store is
...  FailStore._fail_store)
True
```

class `django_crucrudile.entities.store.`**`EntityStoreMetaclassMixin`**(*name*, *bases*, *attrs*)

Bases: `builtins.type`

Allows `EntityStore` to use a different `_base_store` store (list instance) for each class definitions (`cls` instantiation)

```
>>> class Store(metaclass=EntityStoreMetaclassMixin):
...   pass
>>>
>>> class FailStore:
...   _fail_store = []
>>>
>>> class NewStore(Store):
...   pass
>>>
>>> class FailNewStore(FailStore):
...   pass

>>> (NewStore._base_store is
...  Store._base_store)
False

>>> (FailNewStore._fail_store is
...  FailStore._fail_store)
True
```

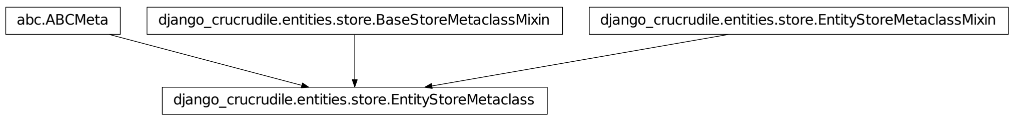
class `django_crucrudile.entities.store.`**`EntityStoreMetaclass`**(*name*, *bases*, *attrs*)

Bases: `django_crucrudile.entities.store.EntityStoreMetaclassMixin`, `django_crucrudile.entities.store.BaseStoreMetaclassMixin`, `abc.ABCMeta`

Use the entity store and base store metaclass mixins, that handle creating a new instance of the stores for each class definition.

See `EntityStoreMetaclassMixin` and `BaseStoreMetaclassMixin` for more information.

Note: Also subclasses `abc.ABCMeta` because it will be used as the metaclass for an entity, and entity are abstract classes, which needs the â`bc.ABCMeta` base class.


abc.ABCMeta
django_crucrudile.entities.store.BaseStoreMetaclassMixin
django_crucrudile.entities.store.EntityStoreMetaclassMixin
django_crucrudile.entities.store.EntityStoreMetaclass

class `django_crucrudile.entities.store.`**`EntityStore`**

Bases: `builtins.object`

Provides an entity store, and a `register()` method that registers entities in the entity store.

The subclass implementation of `patterns()` should iterate over the entity store.

static **`register_apply_map`**(*entity*, *mapping*, *transform_kwargs=None*, *silent=True*)

Apply mapping of value in `mapping` if `entity` is subclass (`issubclass()`) or instance (`isinstance()`) of key

Parameters

- **entity** (*object or class*) – Object to pass to found mappings
- **mapping** (*dict*) – Register mapping, used to get callable to pass `entity` to
- **transform_kwargs** (*dict*) – Extra keyword arguments to pass to the found transform functions (mapping keys)
- **silent** – If set to `False`, will fail if not matching mapping was found.

Raises LookupError If `silent` is `False`, and no matching mapping was found

```
>>> from mock import Mock
>>>
>>> class Class:
...   pass
>>> class SubClass(Class):
...   pass
>>> class OtherClass:
...   pass
>>>
>>> instance = SubClass()
```

With instance :

```
>>> class_mock = Mock()
>>> applied = EntityStore.register_apply_map(
...   instance,
...   {Class: class_mock}
... )
>>> class_mock.assert_called_once_with(instance)
```

With instance, and default mapping :

```
>>> class_mock = Mock()
>>> applied = EntityStore.register_apply_map(
...   instance,
...   {None: class_mock}
... )
>>> class_mock.assert_called_once_with(instance)
```

With instance and iterable bases :

```
>>> class_mock = Mock()
>>> applied = EntityStore.register_apply_map(
...   instance,
...   {(OtherClass, Class): class_mock}
... )
>>> class_mock.assert_called_once_with(instance)
```

With instance and iterable bases (no matching base) :

```
>>> class_mock = Mock()
>>> applied = EntityStore.register_apply_map(
...   instance,
...   {(OtherClass, ): class_mock}
... )
>>> applied is instance
True
>>> class_mock.called
False
```

With instance and iterable bases (no matching base, not silent) :

```
>>> class_mock = Mock()
>>> applied = EntityStore.register_apply_map(
...   instance,
...   {(OtherClass, ): class_mock},
...   silent=False
... )
...
Traceback (most recent call last):
  ...
LookupError: Could not find matching key in register
mapping. Used test 'isinstance', register mapping bases are
'OtherClass', tested against 'SubClass'
```

With subclass :

```
>>> class_mock = Mock()
>>> applied = EntityStore.register_apply_map(
...   SubClass,
...   {Class: class_mock}
... )
>>> class_mock.assert_called_once_with(SubClass)
```

With subclass and iterable bases (no matching base) :

```
>>> class_mock = Mock()
>>> applied = EntityStore.register_apply_map(
...   SubClass,
...   {(OtherClass, ): class_mock}
... )
>>> applied is SubClass
True
>>> class_mock.called
False
```

With subclass and single bases (no matching base, not silent) :

```
>>> class_mock = Mock()
>>> applied = EntityStore.register_apply_map(
...   SubClass,
...   {OtherClass: class_mock},
...   silent=False
... )
...
Traceback (most recent call last):
  ...
LookupError: Could not find matching key in register
mapping. Used test 'issubclass', register mapping bases are
'OtherClass', tested against 'SubClass'
```

With subclass and no mappings (not silent) :

```
>>> class_mock = Mock()
>>> applied = EntityStore.register_apply_map(
...   SubClass,
...   {},
...   silent=False
... )
...
Traceback (most recent call last):
  ...
LookupError: Could not find matching key in register
mapping. Used test 'issubclass', register mapping bases are
'', tested against 'SubClass'
```

classmethod `get_register_class_map`()

Mapping of type to function that will be evaluated (with entity) when calling register. See `register_class()` and `register_apply_map()`.

Overriding implementations must call the base implementation (using super(), usually), so that the base mappings set by `set_register_class_mapping()` can be returned.

The base implementation returns a copy of the stored mapping, so overriding implementations may append to the return value.

Warning: The matching mapping will be used. This is why this method must return an `collections.OrderedDict`, so that the adding order is used.

See also:

For doctests that use this member, see `django_crucrudile.entities.store.EntityStore.register_clas`

classmethod **`get_register_class_map_kwargs`**()

Arguments passed when applying register map, in `register_class()`

See also:

For doctests that use this member, see `django_crucrudile.entities.store.EntityStore.register_clas`

`get_register_map`()

Mapping of type to function that will be evaluated (with entity) when calling register. See `register()` and `register_apply_map()`

Overriding implementations *MUST* call the base implementation (using super(), usually), so that the base mappings set by `set_register_mapping()` can be returned.

The base implementation returns a copy of the stored mapping, so overriding implementations may append to the return value.

Warning: The matching mapping will be used. This is why this method must return an `collections.OrderedDict`, so that the adding order is used.

See also:

For doctests that use this member, see `django_crucrudile.entities.store.EntityStore.register()`

`get_register_map_kwargs`()

Arguments passed when applying register map, in `register()`

See also:

For doctests that use this member, see `django_crucrudile.entities.store.EntityStore.register()`

classmethod **`set_register_class_mapping`**(*key*, *value*)

Set a base register class mapping, that will be returned (possibly with other mappings) by `get_register_class_map()`.

Parameters

- **key** (*class or tuple of classes*) – Register class mapping bases
- **value** (*callable*) – Register class mapping value

```
>>> from mock import Mock
>>> mock_mapping_func = Mock()
>>>
>>> class Class:
...   pass
>>> class Store(EntityStore):
...   pass
>>>
>>>
>>> Store.set_register_class_mapping(
...   Class, mock_mapping_func
... )
>>> Store.get_register_class_map() == (
...   {Class: mock_mapping_func}
... )
True
```

classmethod **`set_register_mapping`**(*key*, *value*)

Set a base register mapping, that will be returned (possibly with other mappings) by `get_register_map()`.

Parameters

- **key** (*class or tuple of classes*) – Register mapping bases
- **value** (*callable*) – Register mapping value

```
>>> from mock import Mock
>>> mock_mapping_func = Mock()
>>>
>>> class Class:
...   pass
>>>
>>> class Store(EntityStore):
...   pass
>>>
>>> Store.set_register_mapping(
...   Class, mock_mapping_func
... )
>>> Store().get_register_map() == (
...   {Class: mock_mapping_func}
... )
True
```

classmethod **`register_class`**(*register_cls*, *map_kwargs=None*)

Add a route class to `_base_store`, appling mapping from `get_register_class_map()` where required. This route class will be instantiated (with kwargs from `get_base_store_kwargs()`) when the Router is itself instiated, using `register_base_store()`.

Parameters

- **register_cls** – Object to register (usually Route or Router classes, but could be anything because of possible mapping in `get_register_class_map_kwargs()`)
- **map_kwargs** (*dict*) – Argument to pass to mapping value if entity gets transformed.

Returns The registered class, transformed by class register mappings if there was a matching mapping

Return type class

```
>>> from mock import Mock
>>> mock_entity_instance = Mock()
>>> mock_entity = Mock()
>>> mock_entity.side_effect = [mock_entity_instance]
>>> mock_mapping_func = Mock()
>>> mock_mapping_func.side_effect = [mock_entity]
>>>
>>> class Class:
...  pass
>>>
>>> class Store(EntityStore):
...   @classmethod
...   def get_register_class_map(self):
...     return {Class: mock_mapping_func}
>>>
>>> Store.register_class(Class) is mock_entity
True
>>>
>>> Store._base_store == [mock_entity]
True
>>>
>>> store = Store()
>>> store._store == [mock_entity_instance]
True
```

register(*entity*, *map_kwargs=None*)

Register routed entity, applying mapping from `get_register_map()` where required

Parameters

- **entity** (`django_crucrudile.entities.Entity`) – Entity to register
- **map_kwargs** (*dict*) – Argument to pass to mapping value if entity gets transformed.

Returns The registered entity, transformed by register mappings if there was a matching mapping

Return type `django_crucrudile.entities.Entity`

```
>>> from mock import Mock
>>> mock_entity_instance = Mock()
>>> mock_mapping_func = Mock()
>>> mock_mapping_func.side_effect = [mock_entity_instance]
>>>
>>> class Class:
...  pass
>>> instance = Class()
>>>
>>> class Store(EntityStore):
...   @classmethod
...   def get_register_map(self):
...     return {Class: mock_mapping_func}
>>>
>>> store = Store()
>>> store.register(instance) == mock_entity_instance
True
>>> store._store == [mock_entity_instance]
True
```

get_base_store_kwargs()

Arguments passed when instantiating entity classes in `_base_store`

Returns Keyword arguments

Return type dict

```
>>> from mock import Mock
>>> mock_entity = Mock()
>>>
>>> class Store(EntityStore):
...   def get_base_store_kwargs(self):
...     return {'x': mock_entity}
>>>
>>> Store.register_class(lambda x: x) is not None
True
>>>
>>> store = Store()
>>> store._store == [mock_entity]
True
```

register_base_store()

Instantiate entity classes in _base_store, using arguments from `get_base_store_kwargs()`

```
>>> class Store(EntityStore):
...     pass
>>>
>>> Store.register_class(lambda: None) is not None
True
>>>
>>> store = Store()
>>> store._store
[None]
```

3.3 Entity abstract class

Contents

An entity is an abstract class of objects that can be used to make an URL pattern tree.

See also:

In `django-crucrudile`, there are two classes that directly subclass `Entity` :

- `django_crucrudile.routers.Router` (concrete)
- `django_crucrudile.routes.base.BaseRoute` (abstract)

class `django_crucrudile.entities.`**`Entity`**(*index=None*)

Bases: `builtins.object`

An entity is an abstract class of objects that can be used to make an URL pattern tree.

Abstract class that defines an attribute (`Entity.index`), and an abstract method (`Entity.patterns()`). Entity implementations should provide the `Entity.patterns()` method, that should return a generator yielding Django URL patterns.

Warning: Abstract class ! Subclasses should define the abstract `patterns()` method, that should return a generator yielding Django URL objects (`django.core.urlresolvers.RegexURLPattern` or *:class:'django.core.urlresolvers.RegexURLResolver*). See warning in `__init__()`.

`index` = **False**

Attribute index Used when routed entity is registered, to know if it should be registered as index.

`patterns`(*parents=None*, *add_redirect=None*, *add_redirect_silent=None*)

Yield URL patterns

Note: For argument specification, see implementations of this abstract function (in particular `django_crucrudile.routers.Router.patterns()`)

Warning: Abstract method ! Should be defined by subclasses, and should return a generator yielding Django URL objects (`RegexURLPattern` or `RegexURLResolver`)

get_str_tree(*patterns_kwargs=None*, *indent_char=' '*, *indent_size=2*)
Return the representation of a entity patterns structure

Parameters

- **patterns_kwargs** (*dict*) – Keyword arguments to pass to `patterns()`
- **indent_char** (*str*) – String to use for tree indentation
- **indent_size** (*int*) – Indent size

```
>>> import tests.unit
>>> from django.db.models import Model
>>> from django_crucrudile.routers import Router, ModelRouter
>>>
>>> # needed to subclass Django Model
>>> __name__ = "tests.doctests"
>>>
>>> class TestModel(Model):
...   pass

>>> router = Router(generic=True)
>>>
>>> router.register(TestModel) is not None
True

>>> print(router.get_str_tree())
...
 - Router  @ ^
   - GenericModelRouter testmodel @ ^testmodel/
     - testmodel-list-redirect @ ^$ RedirectView
     - testmodel-delete @ ^delete/(?P<pk>\d+)$ DeleteView
     - testmodel-delete @ ^delete/(?P<slug>[\w-]+)$ DeleteView
     - testmodel-update @ ^update/(?P<pk>\d+)$ UpdateView
     - testmodel-update @ ^update/(?P<slug>[\w-]+)$ UpdateView
     - testmodel-create @ ^create$ CreateView
     - testmodel-detail @ ^detail/(?P<pk>\d+)$ DetailView
     - testmodel-detail @ ^detail/(?P<slug>[\w-]+)$ DetailView
     - testmodel-list @ ^list$ ListView
```

class `django_crucrudile.entities.`**Entity**(*index=None*)
Bases: `builtins.object`

An entity is an abstract class of objects that can be used to make an URL pattern tree.

Abstract class that defines an attribute (`Entity.index`), and an abstract method (`Entity.patterns()`). Entity implementations should provide the `Entity.patterns()` method, that should return a generator yielding Django URL patterns.

> **Warning:** Abstract class ! Subclasses should define the abstract `patterns()` method, that should return a generator yielding Django URL objects (`django.core.urlresolvers.RegexURLPattern` or *:class:'django.core.urlresolvers.RegexURLResolver*). See warning in `__init__()`.

`index` **= False**

Attribute index Used when routed entity is registered, to know if it should be registered as index.

`patterns`(*parents=None*, *add_redirect=None*, *add_redirect_silent=None*)
Yield URL patterns

> **Note:** For argument specification, see implementations of this abstract function (in particular `django_crucrudile.routers.Router.patterns()`)

> **Warning:** Abstract method ! Should be defined by subclasses, and should return a generator yielding Django URL objects (`RegexURLPattern` or `RegexURLResolver`)

`get_str_tree`(*patterns_kwargs=None*, *indent_char=' '*, *indent_size=2*)
Return the representation of a entity patterns structure

Parameters

- **patterns_kwargs** (*dict*) – Keyword arguments to pass to `patterns()`
- **indent_char** (*str*) – String to use for tree indentation
- **indent_size** (*int*) – Indent size

```
>>> import tests.unit
>>> from django.db.models import Model
>>> from django_crucrudile.routers import Router, ModelRouter
>>>
>>> # needed to subclass Django Model
>>> __name__ = "tests.doctests"
>>>
>>> class TestModel(Model):
...   pass

>>> router = Router(generic=True)
>>>
>>> router.register(TestModel) is not None
True

>>> print(router.get_str_tree())
...
 - Router  @ ^
- GenericModelRouter testmodel @ ^testmodel/
  - testmodel-list-redirect @ ^$ RedirectView
  - testmodel-delete @ ^delete/(?P<pk>\d+)$ DeleteView
  - testmodel-delete @ ^delete/(?P<slug>[\w-]+)$ DeleteView
  - testmodel-update @ ^update/(?P<pk>\d+)$ UpdateView
  - testmodel-update @ ^update/(?P<slug>[\w-]+)$ UpdateView
  - testmodel-create @ ^create$ CreateView
  - testmodel-detail @ ^detail/(?P<pk>\d+)$ DetailView
  - testmodel-detail @ ^detail/(?P<slug>[\w-]+)$ DetailView
  - testmodel-list @ ^list$ ListView
```

3.4 Router and router mixins

Contents

A router is an implementation of the abstract class Entity, that uses an entity store to allow routing other entities. In the code, this is represented by subclassing `django_crucrudile.entities.store.EntityStore` and `django_crucrudile.entities.Entity`, and providing a generator in `patterns()`, yielding URL patterns made from the entity store. Providing `django_crucrudile.entities.Entity.patterns()` makes router classes concrete implementations of the Entity abstract class, which allows them to be used in entity stores.

This module contains three implementations of routers, a simple one, and two implementations adapted to Django models :

- `Router` : implements the abstract class `django_crucrudile.entities.Entity`, and subclassing `django_crucrudile.entities.store.EntityStore` to implement `Router.patterns()`
- `model.ModelRouter` : subclasses `Router`, instantiate with a model as argument, adapted to pass that model as argument to registered entity classes
- `model.generic.GenericModelRouter` : that subclasses `model.ModelRouter` along with a set of default `django_crucrudile.routes.ModelViewRoute` for the five default Django generic views.

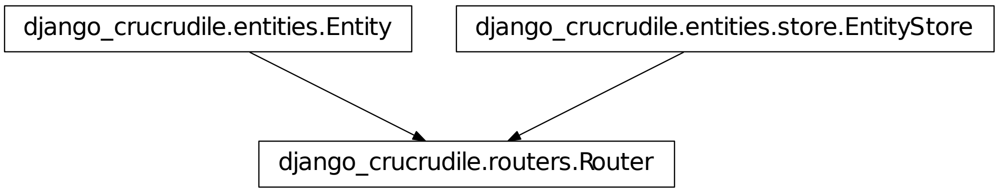
3.4.1 Base router

class `django_crucrudile.routers.`**`Router`**(*namespace=None*, *url_part=None*, *redirect=None*, *add_redirect=None*, *add_redirect_silent=None*, *get_redirect_silent=None*, *generic=None*, ***kwargs*)

Bases: `django_crucrudile.entities.store.EntityStore`, `django_crucrudile.entities.Entity`

RoutedEntity that yields an URL group containing URL patterns from the entities in the entity store (`django_crucrudile.entities.store.EntityStore`). The URL group can be set have an URL part and na namespace.

Also handles URL redirections : allows setting an Entity as “index”, which means that it will become the default routed entity for the parent entity (implementation details in `get_redirect_pattern()`).


django_crucrudile.entities.Entity
django_crucrudile.entities.store.EntityStore
django_crucrudile.routers.Router

redirect_max_depth = **100**

Attribute redirect_max_depth Max depth when following redirect attributes

__init__(*namespace=None*, *url_part=None*, *redirect=None*, *add_redirect=None*, *add_redirect_silent=None*, *get_redirect_silent=None*, *generic=None*, ***kwargs*)

Initialize Router base attributes from given arguments

Parameters

- **namespace** – Optional. See `namespace`
- **url_part** – Optional. See `url_part`
- **redirect** – Optional. See `redirect`
- **add_redirect** – Optional. See `add_redirect`
- **add_redirect_silent** – Optional. See `add_redirect_silent`
- **get_redirect_silent** – Optional. See `get_redirect_silent`
- **generic** – Optional. See `generic`

namespace = **None**

Attribute namespace If defined, group this router's patterns in an URL namespace

url_part = **None**

Attribute url_part If defined, add to router URL (use when as regex when building URL group)

redirect = **None**

Attribute redirect If defined, `Router` will add a redirect view to the returned patterns. To get the redirect target, `get_redirect_pattern()` will follow `redirect` attributes in the stored entities. The attribute's value is altered by the `register()`, if `index` is `True` in its arguments or if the registered entity `django_crucrudile.entities.Entity.index` attribute is set to True.

add_redirect = **None**

Attribute add_redirect Add redirect pattern when calling `patterns()`. If None (default), will be guessed using `redirect` (Add redirect only if there is one defined)

add_redirect_silent = **False**

Attribute add_redirect_silent Fail silently when the patterns reader is asked to add the redirect patterns and the redirect attribute is not set (on self). Defaults to False, because in the default configuration, `add_redirect` is guessed using `redirect`, using `bool`. Set to True if you're using `add_redirect` explicitly and want the redirect pattern to be optional.

get_redirect_silent = False

Attribute get_redirect_silent Fail silently when following redirect attributes to find the redirect URL name (if no URL name is found).

generic = False

Attribute generic If True, `get_register_map()` will return a `model.generic.GenericModelRouter` (with preconfigured Django views) for the `Model` type.

get_register_map()

Add two base register mappings (to the mappings returned by the super implementation)

- `django.db.models.Model` subclasses are passed to a `model.ModelRouter` (or `model.generic.GenericModelRouter`) if `generic` is set to `True`)
- `django.views.generic.detail.SingleObjectMixin` or `django.views.generic.list.MultipleObjectMixin` subclasses are passed to a `django_crucrudile.routes.ModelViewRoute`
- `django.views.generic.View` subclasses are passed to a View

returns Register mappings

rtype dict

Warning: When overriding, remember that the first matching mapping (in the order they are added, as the superclass returns a `collections.OrderedDict`) will be used.
Because of this, to override mappings, methods should add the super mappings to another OrderedDict, containing the overrides.

register(*entity*, *index=False*, *map_kwargs=None*)

Register routed entity, using `django_crucrudile.entities.store.EntityStore.register()`

Set as index when `index` or `entity.index` is True.

Parameters

- **entity** (`django_crucrudile.entities.Entity`) – Entity to register
- **index** (*bool*) – Register as index (set `redirect` to `entity`
- **map_kwargs** (*dict*) – Optional. Keyword arguments to pass to mapping value if entity gets transformed.

```
>>> from mock import Mock
>>> router = Router()

>>> entity = Mock()
>>> entity.index = False
>>>
>>> router.register(entity) is not None
True
>>> router.redirect is None
True

>>> entity = Mock()
>>> entity.index = False
>>>
>>> router.register(entity, index=True) is not None
True
```

```
>>> router.redirect is entity
True

>>> entity = Mock()
>>> entity.index = True
>>>
>>> router.register(entity) is not None
True
>>> router.redirect is entity
True
```

get_redirect_pattern(*namespaces=None*, *silent=None*, *redirect_max_depth=None*)

Compile the URL name to this router's redirect path (found by following `Router.redirect`), and that return a lazy `django.views.generic.RedirectView` that redirects to this URL name

Parameters

- **namespaces** (*list of str*) – Optional. The list of namespaces will be used to get the current namespaces when building the redirect URL name. If not given an empty list will be used.
- **silent** (*bool*) – Optional. See `Router.get_redirect_silent`
- **redirect_max_depth** (*int*) – Optional. See `Router.redirect_max_depth`

Raises

- **OverflowError** – If the depth-first search in the graph made from redirect attributes reaches the depth in `redirect_max_depth` (to intercept graph cycles)
- **ValueError** – If no redirect found when following `redirect` attributes, and silent mode is not enabled.

```
>>> from mock import Mock
>>> entity = Mock()
>>> entity.redirect.redirect = 'redirect_target'
>>>
>>> router = Router()
>>> router.register(entity) is not None
True
>>>
>>> pattern = router.get_redirect_pattern()
>>>
>>> type(pattern).__name__
'RegexURLPattern'
>>> pattern.callback.__name__
'RedirectView'
>>> pattern._target_url_name
'redirect_target'

>>> from mock import Mock
>>> entity = Mock()
>>> entity.redirect.redirect = 'redirect_target'
>>>
>>> router = Router()
>>> router.register(entity) is not None
True
>>>
>>> pattern = router.get_redirect_pattern(
...   namespaces=['ns1', 'ns2']
... )
>>> type(pattern).__name__
```

```
'RegexURLPattern'
>>> pattern.callback.__name__
'RedirectView'
>>> pattern._target_url_name
'ns1:ns2:redirect_target'

>>> entity = Mock()
>>> entity.redirect.redirect = entity
>>>
>>> router = Router()
>>> router.register(entity) is not None
True
>>>
>>> router.get_redirect_pattern()
...
Traceback (most recent call last):
  ...
OverflowError: Depth-first search reached its maximum (100)
depth, without returning a leaf item (string).Maybe the
redirect graph has a cycle ?

>>> entity = Mock()
>>> entity.__str__ = lambda x: 'mock redirect'
>>> entity.redirect = None
>>>
>>> router = Router()
>>> router.register(entity) is not None
True
>>>
>>> router.get_redirect_pattern()
...
Traceback (most recent call last):
  ...
ValueError: Failed following redirect attribute (mock
redirect) (last redirect found : mock redirect, redirect
value: None)) in Router
```

patterns (*namespaces=None*, *add_redirect=None*, *add_redirect_silent=None*)

Read `_store` and yield a pattern of an URL group (with url part and namespace) containing entities's patterns (obtained from the entity store), also yield redirect patterns where defined.

Parameters

- **namespaces** (*list of str*) – We need `patterns()` to pass `namespaces` recursively, because it may be needed to make redirect URL patterns
- **add_redirect** (*bool*) – Override `Router.add_redirect`
- **add_redirect_silent** – Override `Router.add_redirect_silent`

```
>>> from mock import Mock
>>> router = Router()
>>> pattern = Mock()

>>> entity_1 = Mock()
>>> entity_1.index = False
>>> entity_1.patterns = lambda *args: ['MockPattern1']
>>>
>>> router.register(entity_1) is not None
True
```

```
>>>
>>> list(router.patterns())
[<RegexURLResolver <str list> (None:None) ^>]
>>> next(router.patterns()).url_patterns
['MockPattern1']

>>> entity_2 = Mock()
>>> entity_2.index = True
>>> entity_2.redirect = 'redirect_target'
>>> entity_2.patterns = lambda *args: ['MockPattern2']
>>>
>>> router.register(entity_2) is not None
True
>>>
>>> list(router.patterns())
...
[<RegexURLResolver <RegexURLPattern list> (None:None) ^>]
>>> next(router.patterns()).url_patterns
...
[<RegexURLPattern redirect_target-redirect ^$>,
 'MockPattern1', 'MockPattern2']

>>> router.redirect = None
>>>
>>> list(router.patterns(add_redirect=True))
...
Traceback (most recent call last):
  ...
ValueError: No redirect attribute set (and
``add_redirect_silent`` is ``False``).
```

3.4.2 Router mixins

Model router mixin

class `django_crucrudile.routers.mixins.model.`**`ModelMixin`**(*model=None*, *url_part=None*, ***kwargs*)

Bases: `builtins.object`

ModelRouter with no views. Give `model` kwarg where needed, ask it in `__init__()`, and map `SingleObjectMixin` and `MultipleObjectMixin` to `django_crucrudile.routes.ModelViewRoute` in register functions.

`__init__`(*model=None*, *url_part=None*, ***kwargs*)

Read model (from args or class-level value (`model`), fail if none found.

Parameters **model** (`django.db.Models`) – see `model`

Raises ValueError if model not passed an argument and not defined on class

`model` = None

Attribute model Model used when building router URL name and URL part, and passed to registered routes. Must be defined at class-level or passed to `__init__()`.

`model_url_part`

Return the model name to be used when building the URL part

Returns URL part from the Django model name (`model._meta.model_name`)

Return type str

```
>>> from mock import Mock
>>>
>>> model = Mock()
>>> model._meta.model_name = 'testmodel'
>>> route = ModelMixin(model=model)
>>>
>>> route.model_url_part
'testmodel'
```

`get_register_map_kwargs``()`

Add `model` as kwarg when applying register map

Returns Keyword arguments to pass to mapping value, when applying register map (from `get_register_map()`) in `register()`

Return type dict

See also:

For doctests that use this member, see `django_crucrudile.routers.model.ModelRouter`

`get_base_store_kwargs``()`

Add `model` so that the route classes in the base store will get the model as a kwarg when being instantiated

Returns Keyword arguments to pass to mapping value, when applying class register map (from `get_register_class_map()`) in `register_class()`

Return type dict

See also:

For doctests that use this member, see `django_crucrudile.routers.model.ModelRouter`

classmethod `get_register_class_map``()`

Add `django_crucrudile.routes.ModelViewRoute.make_for_view()` mapping for `SingleObjectMixin` and `MultipleObjectMixin`.

This mapping allows registering Django generic views in the base store, so that entities made using `django_crucrudile.routes.ModelViewRoute` (and instantiated with `model`) get registered in the entity store when `ModelMixin` gets instantiated (in `django_crucrudile.entities.store.EntityStore.register_base_store()`).

`django_crucrudile.routes.ModelViewRoute.make_for_view()` creates a new `django_crucrudile.routes.ModelViewRoute` class, and uses its argument as the `django_crucrudile.routes.ViewRoute.view_class` attribute.

Returns Base store mappings

Return type dict

Warning: When overriding, remember that the first matching mapping (in the order they are added, as the superclass returns a `collections.OrderedDict`) will be used.
Because of this, to override mappings, methods should add the super mappings to another OrderedDict, containing the overrides.

See also:

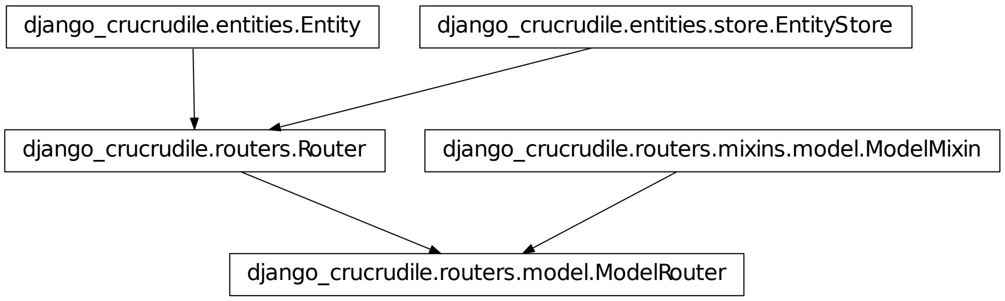
For doctests that use this member, see `django_crucrudile.routers.model.ModelRouter`

3.4.3 Model router

class `django_crucrudile.routers.model.`**`ModelRouter`**(*model=None*, *url_part=None*, ***kwargs*)

Bases: `django_crucrudile.routers.mixins.model.ModelMixin`, `django_crucrudile.routers.Router`

Model router, implements `django_crucrudile.routers.mixins.model.ModelMixin`with :class:`django_crucrudile.routers.Router`, to provide a Model that passes the model when instantiating entities.


django_crucrudile.entities.Entity
django_crucrudile.entities.store.EntityStore
django_crucrudile.routers.Router
django_crucrudile.routers.mixins.model.ModelMixin
django_crucrudile.routers.model.ModelRouter

```
>>> from django.views.generic.detail import SingleObjectMixin
>>> from mock import Mock
>>>
>>> class GenericView(SingleObjectMixin):
...   pass
>>> class NotGenericView:
...   pass

>>> model = Mock()
>>> view = Mock()
>>>
>>> model._meta.model_name = 'modelname'
>>>
>>> router = ModelRouter(model=model)
>>>
>>> router.model_url_part
'modelname'

>>> router.register(GenericView) is not None
True
```

Generic model router

class `django_crucrudile.routers.model.generic.`**`GenericModelRouter`**(*model=None*, *url_part=None*, ***kwargs*)

Bases: `django_crucrudile.routers.model.ModelRouter`

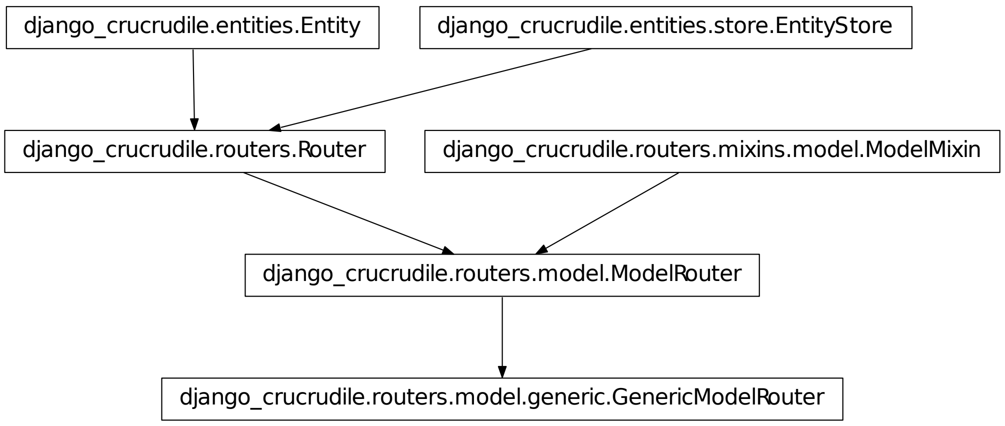
Generic model router, subclasses `django_crucrudile.routers.model.ModelRouter` and use 5 Django generic views for each registered model.

Provides specific `django_crucrudile.routes.ModelViewRoute` classes, created for the following Django generic views :

- `django.views.generic.ListView`
- `django.views.generic.DetailView`
- `django.views.generic.CreateView`
- `django.views.generic.UpdateView`
- `django.views.generic.DeleteView`

These classes are registered in the base store, using `django_crucrudile.entities.store.EntityStore.register` or the `django_crucrudile.entities.store.provides()` decorator. They will be instantiated (with the model as argument) when the router is itself instantiated, using `django_crucrudile.entities.store.EntityStore.register_base_store()`.

We use our own class mapping, to use our own route, because we want to add the arguments specification to the route automatically.


django_crucrudile.entities.Entity
django_crucrudile.entities.store.EntityStore
django_crucrudile.routers.Router
django_crucrudile.routers.mixins.model.ModelMixin
django_crucrudile.routers.model.ModelRouter
django_crucrudile.routers.model.generic.GenericModelRouter

```
>>> # these two lines are required to subclass Django model in doctests
>>> import tests.unit
>>> __name__ = "tests.doctests"
>>> from django.db.models import Model
>>> from django_crucrudile.routers import Router, ModelRouter
>>>
>>> class TestModel(Model):
...   pass
```

```
>>> router = Router(generic=True)
>>>
>>> router.register(TestModel) is not None
True

>>> print(router.get_str_tree())
...
 - Router  @ ^
   - GenericModelRouter testmodel @ ^testmodel/
     - testmodel-list-redirect @ ^$ RedirectView
     - testmodel-delete @ ^delete/(?P<pk>\d+)$ DeleteView
     - testmodel-delete @ ^delete/(?P<slug>[\w-]+)$ DeleteView
     - testmodel-update @ ^update/(?P<pk>\d+)$ UpdateView
     - testmodel-update @ ^update/(?P<slug>[\w-]+)$ UpdateView
     - testmodel-create @ ^create$ CreateView
     - testmodel-detail @ ^detail/(?P<pk>\d+)$ DetailView
     - testmodel-detail @ ^detail/(?P<slug>[\w-]+)$ DetailView
     - testmodel-list @ ^list$ ListView
```

classmethod `get_register_class_map`()

Override super implementation to set the mapping for Django generic views to `django_crucrudile.routes.GenericModelViewRoute`.

For doctests that use this member, see `django_crucrudile.routers.model.generic.GenericModelRou`

3.5 URL utils

Contents

This module contains some utility modules for handling URL building, and the aspect of handling several parts of the URL, each separated by different separators, that may be provided or not (thus, handling separators becomes a bit more complicated).

3.5.1 Decorators

This module defines the `pass_tuple()` decorator, that makes a function :

- run witout the first part of its original arguments
- return the omitted arguments and its original return value

This allows to use chain of functions in `Parsable` that work only on a slice of the arguments (for example, to run some operations while passing a boolean flag).

`django_crucrudile.urlutils.`**`pass_tuple`**`(`*count=1*`)`

Returns a decorator that wraps a function to make it run witout the first part of a tuple in its original arguments and return the omitted arguments contatenated with its original return value.

Parameters **count** (*int*) – Number of arguments to omit, default 1.

Returns Decorator

Return type function

Warning: This function is not the actual decorator, but a function that returns that decorator (with the given tuple slice index). If it is used as a decorator, it should be written `@pass_tuple()` instead of `@pass_tuple`.

```
>>> pack_with_42 = lambda x: (42, x)
>>> pack_with_42(8)
(42, 8)
>>> add_2 = pass_tuple()(lambda x: x + 2)
>>> add_2(pack_with_42(8))
(42, 10)
>>> mul_2 = pass_tuple()(lambda x: x*2)
>>> mul_2(add_2(pack_with_42(8)))
(42, 20)
>>> unpack = lambda x: x[0] + x[1]
>>> unpack(mul_2(add_2(pack_with_42(8))))
62
```

3.5.2 Functions

This module defines the `compose()` function, that compose a list of functions into a single function that returns its arguments, passed in chain to each of the functions. This function is used by `Parsable` to compose the parsers returned by `Parsable.get_parsers()`, in `Parsable.__call__()`.

`django_crucrudile.urlutils.`**`compose`**`(`*functions*, **args*, ***kwargs*`)`

Compose functions together

Parameters **functions** (*list of callables*) – Functions to compose

Returns Composed function

Return type function

Note: This function will pass all other arguments and keyword arguments to the composed functions.

```
>>> compose([lambda x: x*2, lambda x: x+2])(5)
12
```

3.5.3 Classes

- `Separated` allows separator-related options to be passed to `Separated.__init__()` and provides `Separated.get_separator()`
- `Parsable` provides a class which instances can be called (`Parsable.__call__()`), to return the "parsed" version of the instance. The parsed version is made by passing the instance through the functions returned by `Parsable.get_parsers()`

- `OptionalPartList` provides a class that implements `Separated` and `Parsable` with a `list`, and that provides two parsers (that, if needed : transform the original items in tuples ; set the “required” flag to the default value)
- `URLBuilder` subclasses `OptionalPartList` and provides parsers , on top of the original ones, to join the URL parts with adequate separators where required

Generic

Note: These classes provide bases for the `URLBuilder` and `django_crucrudile.routes.mixins.arguments.parser.`
classes.

class `django_crucrudile.urlutils.`**`Separated`**(**args*, *separator=None*, *opt_separator=None*, *required_default=None*, ***kwargs*)

Bases: `builtins.object`

Accepts separator options in `__init__()`, and provide `get_separator()`, that returns the corresponding separator for required and optional parts, based on the separator passed to `__init__()` (or set at class-level).

`__init__`(**args*, *separator=None*, *opt_separator=None*, *required_default=None*, ***kwargs*)

Initialize, set separator options

Parameters

- **separator** – See `separator`
- **opt_separator** – See `opt_separator`
- **required_default** – See `required_default`

`separator` = ‘/’

Attribute separator Separator to use in front of a required item

`opt_separator` = ‘/?’

Attribute opt_separator Separator to use in front of an optional item

`required_default` = True

Attribute required_default If True, items required by default (when None)

`get_separator`(*required=None*)

Get the argument separator to use according to the `required` argument

Parameters **required** (*bool*) – If False, will return the optional argument separator instead of the regular one. Default is True.

Returns Separator

Return type str

```
>>> Separated().get_separator()
'/'
>>> Separated().get_separator(True)
'/'
>>> Separated().get_separator(False)
'/?'
```

class `django_crucrudile.urlutils.`**`Parsable`**

Bases: `builtins.object`

Class whose instances may be called, to return a "parsed" version, obtained by passing the original version in the parsers returned by `get_parsers()`.

```
>>> class TestParsable(Parsable, int):
...   def get_parsers(self):
...     return [lambda x: x*2, lambda x: x+2]
>>>
>>> TestParsable(5)()
12
```

```
>>> class TestParsable(Parsable, int):
...   def get_parsers(self):
...     return []
>>>
>>> TestParsable(5)()
5
```

```
>>> class TestParsable(Parsable, int):
...   def get_parsers(self):
...     return [lambda x: None]
>>>
>>> TestParsable(5)()
```

```
>>> class TestParsable(Parsable, int):
...   def get_parsers(self):
...     return [None]
>>>
>>> TestParsable(5)()
Traceback (most recent call last):
  ...
TypeError: the first argument must be callable
```

```
>>> class TestParsable(Parsable, int):
...   def get_parsers(self):
...     return [lambda x, y: None]
>>>
>>> TestParsable(5)()
Traceback (most recent call last):
  ...
TypeError: <lambda>() missing 1 required positional argument: 'y'

>>> class TestParsable(Parsable, int):
...   def get_parsers(self):
...     return [lambda: None]
>>>
>>> TestParsable(5)()
Traceback (most recent call last):
  ...
TypeError: <lambda>() takes 0 positional arguments but 1 was given
```

get_parsers()
Return parsers list. Base implementation returns an empty list. To add new parsers, override this function and append/prepend the functions to use as parsers.

Returns List of parser functions

Return type list

__call__()
Compose the parsers in `get_parsers()` using `compose()`, and use the composed function to get the parsed version from the original version.

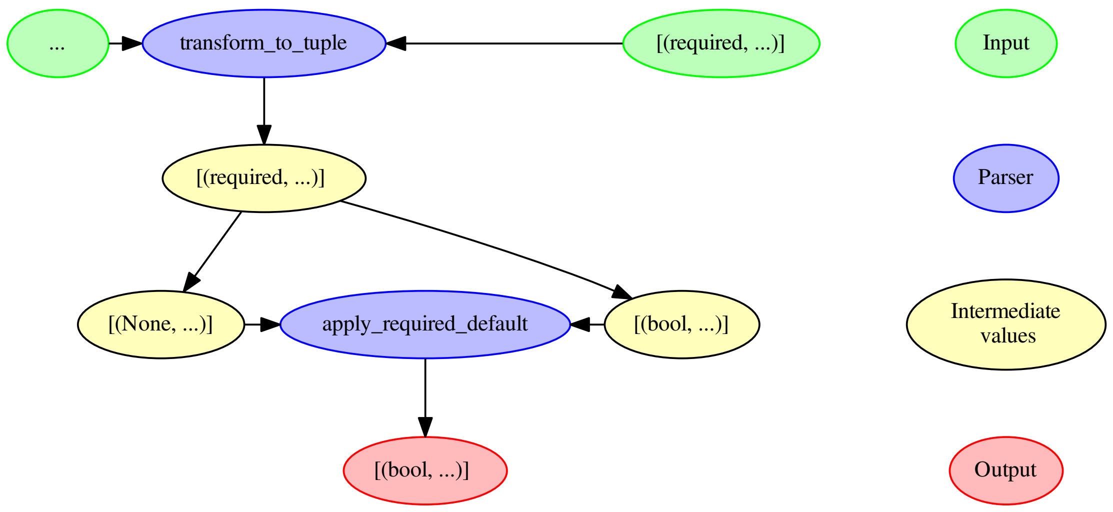
Returns output of parsers

See also:

For doctests that use this member, see `Parsable`

URL parts classes

Optional URL parts list

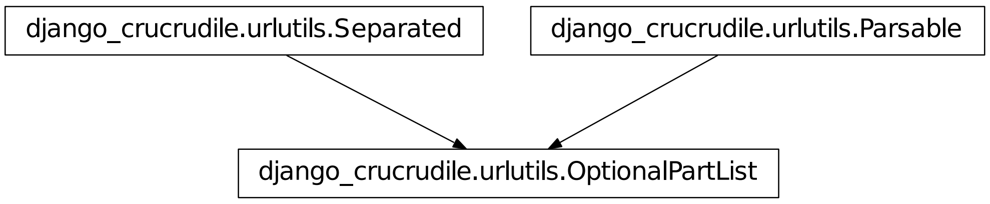


class `django_crucrudile.urlutils.`**`OptionalPartList`**(*iterable=None*, *separator=None*, *opt_separator=None*, *required_default=None*)

Bases: `django_crucrudile.urlutils.Separated`, `django_crucrudile.urlutils.Parsable`, `builtins.list`

Implement Separated and Parsable into a list, to make a separated, parsable URL part list, that handles optional parts and that uses registered parsers (from `get_parsers()`) when the instance is called.

Provide two base parsers, that convert, if needed, original items in 2-tuples (`transform_to_tuple()`), and provide a default value for the first item of the tuple if it's None (`apply_required_default()`).


django_crucrudile.urlutils.Separated
django_crucrudile.urlutils.Parsable
django_crucrudile.urlutils.OptionalPartList

```
>>> builder = OptionalPartList(
...   ["<1>", (None, "<2>"), (False, "<3>")]
... )
>>>
>>> list(builder())
[(True, '<1>'), (True, '<2>'), (False, '<3>')]
```

```
>>> failing_builder = OptionalPartList(
...   ["<1>", (None, "<2>"), (False, "<3>", "fail")]
... )
>>>
>>> list(failing_builder())
Traceback (most recent call last):
  ...
ValueError: too many values to unpack (expected 2)
```

__add__(*other*)

Concatenate with other iterable, creating a new object..

We override `list.__add__()` to return a new `OptionalPartList` instance, instead of a list instance.

Parameters **other** (*iterable*) – Iterable to concatenate with

Returns Concatenated object

Return type type(self)

```
>>> a = OptionalPartList(['foo'])
>>> b = OptionalPartList(['bar'])
>>>
>>> a + b
['foo', 'bar']
>>>
>>> type(a + b)
<class 'django_crucrudile.urlutils.OptionalPartList'>
>>>
>>> (a + b) is a
False
>>>
>>> (a + b) is b
False

>>> (a + None) is a
True
```

__init__(*iterable=None*, *separator=None*, *opt_separator=None*, *required_default=None*)

Initialize, use empty list as iterable if None provided.

Parameters

- **iterable** (*iterable*) – Raw URL part list
- **separator** (*str*) – See `Separated.__init__()`
- **opt_separator** (*str*) – See `Separated.__init__()`
- **required_default** (*bool*) – See `Separated.__init__()`

get_parsers()

Complement `OptionalPartList` parsers (from `OptionalPartList.get_parsers()`) with `transform_to_tuple()` and `apply_required_default()`.

Returns List of parser functions

Return type list

static **transform_to_tuple**(*items*)

Transform each item to a tuple if it's not one

Parameters **items** (*iterable*) – List of items and tuples

Returns List of tuples

Return type iterable of tuple

```
>>> list(OptionalPartList.transform_to_tuple([
...   '<1>',
...   (None, '<2>')
... ]))
[(None, '<1>'), (None, '<2>')]
```

static apply_required_default(*items*, *default*)
Apply default value to first element of item if it's None.

Parameters

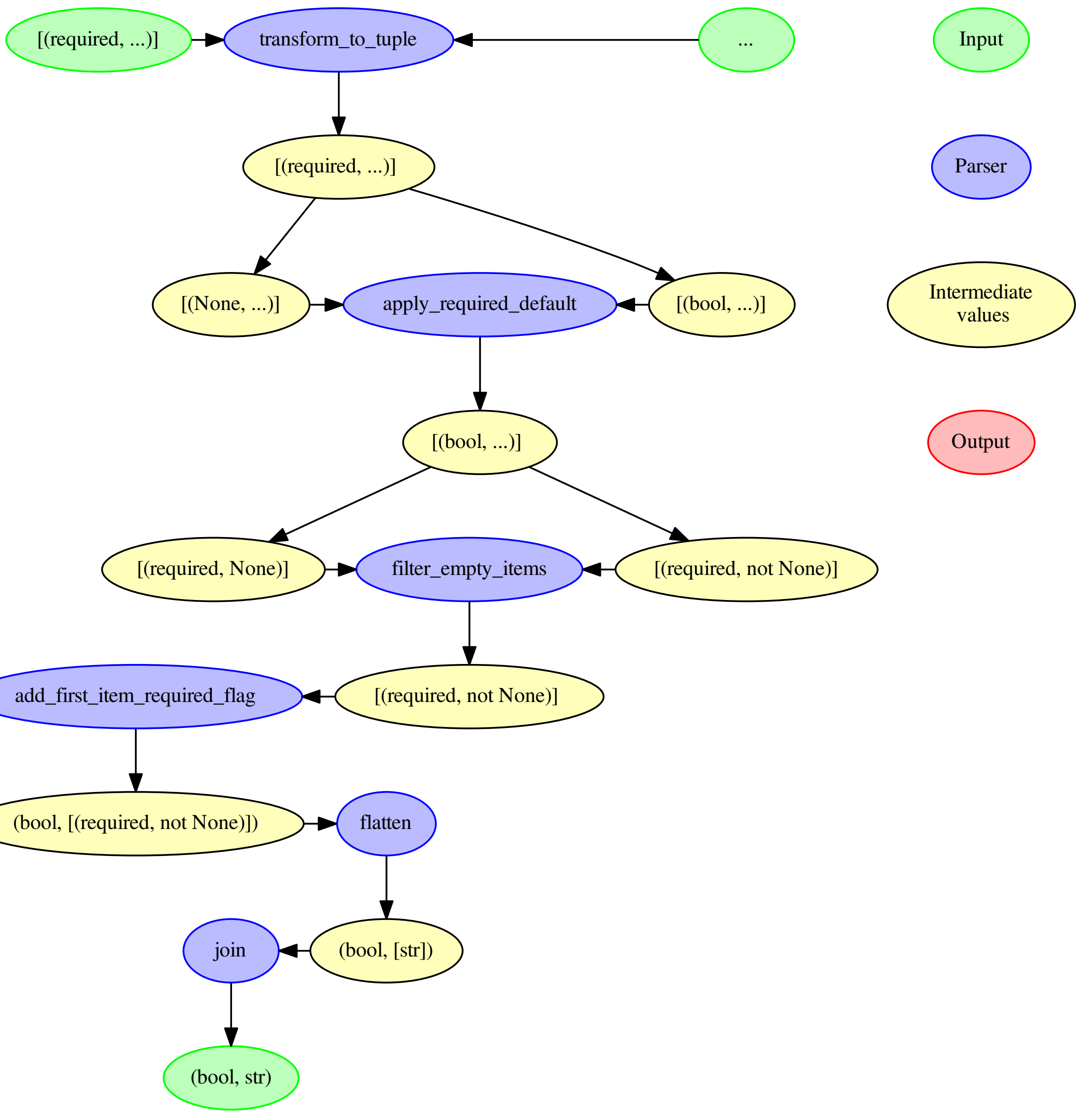
- **items** (*iterable*) – List of tuples
- **default** (*boolean*) – Value to use if none provided

Returns List of tuples, with required default value applied

Return type iterable of tuple

```
>>> list(
...   OptionalPartList.apply_required_default(
...     [
...       ('<provided>', '<1>'),
...       (None, '<2>')
...     ],
...     default='<default>'
...   )
... )
[('<provided>', '<1>'), ('<default>', '<2>')]
```

URL Builder



class `django_crucrudile.urlutils.`**`URLBuilder`**(*iterable=None*, *separator=None*, *opt_separator=None*, *required_default=None*)

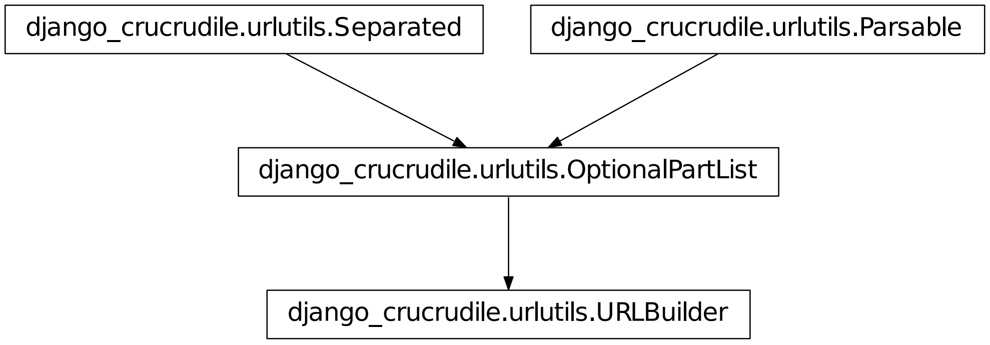
Bases: `django_crucrudile.urlutils.OptionalPartList`

Allows building URLs from a list of URL parts. The parts can be required or optional, this information will be used to determine which separator to use.

We subclass `OptionalPartList`, and add our parsers in `get_parsers()`, so that they are used when the instance gets called :

- `filter_empty_items()`
- `add_first_item_required_flag()`
- `flatten()`

- join()


django_crucrudile.urlutils.Separated
django_crucrudile.urlutils.Parsable
django_crucrudile.urlutils.OptionalPartList
django_crucrudile.urlutils.URLBuilder

```
>>> builder = URLBuilder(
...   ["<1>", (False, "<2>"), (True, "<3>")]
... )
>>>
>>> builder()
(True, '<1>/?<2>/<3>')

>>> builder = URLBuilder(
...   ["<1>", "<2>", (False, "<3>")]
... )
>>>
>>> builder()
(True, '<1>/<2>/?<3>')

>>> builder = URLBuilder(
...   [(False, "<1>"), "<2>", (False, "<3>")]
... )
>>>
>>> builder()
(False, '<1>/<2>/?<3>')

>>> builder = URLBuilder(
...   [(False, "<1>"), None, (True, None)]
... )
>>>
>>> builder()
(False, '<1>')

>>> builder = URLBuilder(
...   [(False, "<1>"), 1]
... )
>>>
>>> builder()
Traceback (most recent call last):
  ...
TypeError: sequence item 2: expected str instance, int found
```

get_parsers()

Complement `OptionalPartList` parsers (from `OptionalPartList.get_parsers()`) with `filter_empty_items()`, `add_first_item_required_flag()`, `flatten()` and `join()`.

Returns List of parser functions

Return type list

static filter_empty_items (*items*)

Filter out items that give False when casted to boolean.

Parameters items (*iterable*) – List of tuples

Returns List of URL part specs (with empty items cleared out)

Return type list of tuple

```
>>> list(URLBuilder.filter_empty_items([
...     (None, ''),
...     (None, '<not empty>'),
...     (None, []),
...     (None, None),
...     (None, '<not empty 2>'),
... ]))
[(None, '<not empty>'), (None, '<not empty 2>')]

>>> list(URLBuilder.filter_empty_items([
...     (None, '<not empty>'),
...     None
... ]))
Traceback (most recent call last):
  ...
TypeError: 'NoneType' object is not iterable
```

static add_first_item_required_flag (*items*)

Return a boolean indicating whether the first item is required, and the list of items.

Parameters items (*iterable*) – List of tuples

Returns Tuple with "first item required" flag, and item list

Return type tuple : (boolean, list)

```
>>> output = URLBuilder.add_first_item_required_flag(
...     [(False, '<opt>'), (True, '<req>')]
... )
>>>
>>> output[0], list(output[1])
(False, [(False, '<opt>'), (True, '<req>')])

>>> output = URLBuilder.add_first_item_required_flag(
...     []
... )
>>>
>>> output[0], list(output[1])
(False, [])

>>> output = URLBuilder.add_first_item_required_flag(
...     [(None, )*3]
... )
Traceback (most recent call last):
  ...
ValueError: too many values to unpack (expected 2)
```

static flatten (*items*, *get_separator*)

Flatten items, adding the separator where required.

Parameters **items** (*iterable*) – List of tuples

Returns List of URL parts with separators

Return type iterable of str

Warning: This function is decorated using `pass_tuple()`, the first part of the tuple in its arguments will be omitted, and inserted at the beginning of the return value, automatically. See the documentation of `pass_tuple()` for more information.

```
>>> get_separator = lambda x: '/'

>>> output = URLBuilder.flatten(
...    (None, [(True, '<1>'), (True, '<2>')]),
...    get_separator
... )
>>>
>>> output[0], list(output[1])
(None, ['<1>', '/', '<2>'])

>>> from mock import Mock
>>>
>>> get_separator = Mock()
>>> get_separator.side_effect = ['/']

>>> output = URLBuilder.flatten(
...    (None, [(True, '<1>'), (True, '<2>')]),
...    get_separator
... )
>>>
>>> output[0], list(output[1])
(None, ['<1>', '/', '<2>'])
>>> get_separator.assert_called_once_with(True)
```

static join (*items*)

Concatenate items into a string

Parameters **items** (*list of str*) – List of URL parts, with separators

Returns Joined URL parts

Return type str

Warning: This function is decorated using `pass_tuple()`, the first part of the tuple in its arguments will be passed automatically. See the documentation of `pass_tuple()` for more information.

```
>>> URLBuilder.join((None, ['a', 'b']))
(None, 'ab')

>>> URLBuilder.join((None, [['a'], 'b']))
Traceback (most recent call last):
  ...
TypeError: sequence item 0: expected str instance, list found
```

```
>>> URLBuilder.join((None, ['a', None]))
Traceback (most recent call last):
  ...
TypeError: sequence item 1: expected str instance, NoneType found
```

CHAPTER 4

Running the tests

Contents

This package uses unit tests and doc tests.

Warning: Documentation tests use an identation size of 2

Note: If you are using a virtual environment, it should be activated before running the following code blocks.

- Online tests (Travis-CI)
- Online coverage reports (Coveralls)

4.1 Dependencies

Dependencies (and test dependencies) are set in the `setup.py`, and installed when the package gets installed (or when the tests are executed for test dependencies).

4.2 Running tests using `setuptools`

The test collector used in `setup.py` is the `runtests.py` script uses the nose test runner to run tests.

Warning: Documentation tests are collected as a single unit test !

- nose tests can be disabled using `NO_NOSE_TESTS=1`
- doctests can be disabled using `NO_SPHINX_TESTS=1`.

Note: The following command does not need any dependency to be installed beforehand, as they will be installed (as Python eggs, in the working directory) by `setuptools` automatically. However, you may want to install them yourself before running the tests (to avoid polluting your working directory with the Python eggs built by `setuptools`) by using `pip`, in that case use `pip install -r tests/requirements.txt`.

```
python setup.py test
```

4.3 Running tests manually

Warning: To run the tests manually, needed dependencies (`pip install -r tests/requirements.txt`) have to be available in the environment.

Warning: To run the tests manually, the `DJANGO_SETTINGS_MODULE` environment variable must be set to `tests.settings`, or to a valid settings module. (`export DJANGO_SETTINGS_MODULE=tests.settings`)

4.3.1 Nose tests

To run nosetests (they include the doctests), use :

```
nosetests
```

4.3.2 Documentation tests

To run doctests manually, use :

```
sphinx-build -E -c docs -b html -a docs var/docs_doctests
```

4.4 Code coverage

Coverage report is automatically executed while running nose tests. `nosetests` prints a basic coverage report, and the HTML coverage report is generated in `vars/coverage_html`.

Coverage reports can also be seen at coveralls.io/r/pstch/django-crucrudile.

4.5 Call graphs

If you install pycallgraph (`pip install pycallgraph`), you can use it to trace call graphs of the executed code. Sadly, it does not work with nosetests, but it's very easy to use it manually, for specific tests :

```
echo "
import tests.integration.test_routers as tests
case = tests.RouterTestCase()
case.setUp()
case.test_get_str_tree()
" | pycallgraph -I django_crucrudile\* graphviz -- /dev/stdin
```

The call graph will be written to `pycallgraph.png`.

Warning: `pycallgraph` may need GraphViz and pydot to be installed (a Python 3 compatible version. At this date, it is available in bitbucket.org/prologic/pydot.)

django-crucrudile provides URL routing classes, which allows you to define your URL routing structure using Router and Route classes, and then to automatically generate an URL pattern structure.

Documentation

Documentation is built using Sphinx (using static reStructuredText files stored in `docs` and Sphinx-formatted docstrings in modules, classes and functions).

Use the following command to build the documentation in `docs/_build`:

```
sphinx-build -E -c docs -b html -a docs docs/_build
```

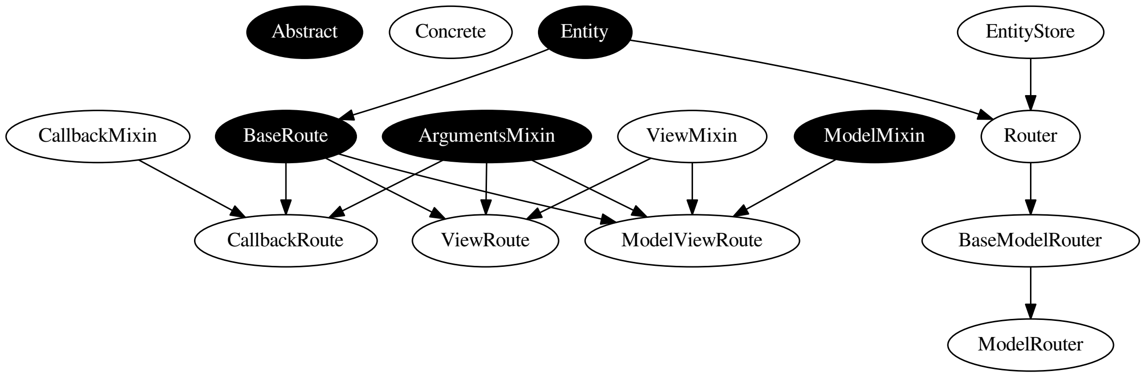
The documentation can also be viewed online, at https://django-crucrudile.readthedocs.org/en/master/.

CHAPTER 6

Versionning

Starting from version `0.9.5`, this package uses semantic version (http://semver.org).

Class structure graph


Abstract
Concrete
Entity
EntityStore
CallbackMixin
BaseRoute
ArgumentsMixin
ViewMixin
ModelMixin
Router
CallbackRoute
ViewRoute
ModelViewRoute
BaseModelRouter
ModelRouter