django-extensions Documentation

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Michael Trier, Bas van Oostveen, and contributors

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Django Extensions is a collection of custom extensions for the Django Framework.

These include management commands, additional database fields, admin extensions and much more.

CHAPTER 1

Getting Started

The easiest way to figure out what Django Extensions are all about is to watch the excellent screencast by Eric Holscher (Direct Vimeo link). In a couple minutes Eric walks you through a half a dozen command extensions.

CHAPTER 2

Getting it

You can get Django Extensions by using pip:

```
$ pip install django-extensions
```

If you want to install it from source, grab the git repository and run setup.py:

```
$ git clone git://github.com/django-extensions/django-extensions.git
$ cd django-extensions
$ python setup.py install
```

Then you will need to add the *django_extensions* application to the `INSTALLED_APPS` setting of your Django project *settings.py* file.

For more detailed instructions check out our *Installation instructions*. Enjoy.

CHAPTER 3

Compatibility with versions of Python and Django

We follow the Django guidelines for supported Python and Django versions. See more at Django Supported Versions

This might mean the django-extensions may work with older or unsupported versions but we do not guarantee it and most likely will not fix bugs related to incompatibilities with older versions.

CHAPTER 4

Contents

4.1 Installation instructions

synopsis Installing django-extensions

4.1.1 Installing

You can use pip to install django-extensions for usage:

```
$ pip install django-extensions
```

4.1.2 Development

Django-extensions is hosted on github:

```
https://github.com/django-extensions/django-extensions
```

Source code can be accessed by performing a Git clone.

Tracking the development version of *django command extensions* should be pretty stable and will keep you up-to-date with the latest fixes.

$ pip install -e git+https://github.com/django-extensions/django-extensions.git#egg=django-extensions

You find the sources in src/django-extensions now.

You can verify that the application is available on your PYTHONPATH by opening a python interpreter and entering the following commands:

```
>>> import django_extensions
>>> django_extensions.VERSION
(0, 8)
```

Keep in mind that the current code in the git repository may be different from the packaged release. It may contain bugs and backwards-incompatible changes but most likely also new goodies to play with.

4.1.3 Configuration

You will need to add the *django_extensions* application to the INSTALLED_APPS setting of your Django project *settings.py* file.:

```
INSTALLED_APPS = (
    ...
    'django_extensions',
)
```

This will make sure that Django finds the additional management commands provided by *django-extensions*.

The next time you invoke *./manage.py help* you should be able to see all the newly available commands.

Some commands or options require additional applications or python libraries, for example:

- 'export_emails' will require the *python vobject* module to create vcard files.
- 'graph_models' requires *pygraphviz* to render directly to image file.

If the given application or python library is not installed on your system (or not in the python path) the executed command will raise an exception and inform you of the missing dependency.

4.2 Admin Extensions

synopsis Admin Extensions

- *ForeignKeyAutocompleteAdmin* - ForeignKeyAutocompleteAdmin will enable the admin app to show ForeignKey fields with an search input field. The search field is rendered by the ForeignKeySearchInput form widget and uses jQuery to do configurable autocompletion.
- *ForeignKeyAutocompleteStackedInline*, *ForeignKeyAutocompleteTabularInline* - in the same fashion of the *ForeignKeyAutocompleteAdmin* these two classes enable a search input field for ForeignKey fields in AdminInline classes.

4.2.1 Depreciation

Django 2.0 now contains similar functionality as *ForeignKeyAutocompleteAdmin* therefore we are deprecating this extension and highly encouraging everyone to update to it.

This code will be removed in the near future when support for Django older then 2.0 is dropped.

More on this: https://docs.djangoproject.com/en/2.0/ref/contrib/admin/#django.contrib.admin.ModelAdmin.autocomplete_fields

4.2.2 Known Issues

- SECURITY ISSUE: Autocompletion does not check permissions nor the requested models on the autocompletion view. This can be used by users with access to the admin to expose data from other models. Please be aware and careful when using *ForeignKeyAutocompleteAdmin*.
- The current version of the *ForeignKeyAutocompleteAdmin* has issues with recent Django versions.

- We strongly suggest project using this extension to update to Django 2.0 and use the native *autocomplete_fields*.

4.2.3 Example Usage

To enable the Admin Autocomplete you can follow this code example in your admin.py file:

```
from django.contrib import admin
from foo.models import Permission
from django_extensions.admin import ForeignKeyAutocompleteAdmin


class PermissionAdmin(ForeignKeyAutocompleteAdmin):
    # User is your FK attribute in your model
    # first_name and email are attributes to search for in the FK model
    related_search_fields = {
       'user': ('first_name', 'email'),
    }

    fields = ('user', 'avatar', 'is_active')

    ...

admin.site.register(Permission, PermissionAdmin)
```

If you are using django-reversion you should follow this code example:

```
from django.contrib import admin
from foo.models import MyVersionModel
from reversion.admin import VersionAdmin
from django_extensions.admin import ForeignKeyAutocompleteAdmin


class MyVersionModelAdmin(VersionAdmin, ForeignKeyAutocompleteAdmin):
    ...

admin.site.register(MyVersionModel, MyVersionModelAdmin)
```

If you need to limit the autocomplete search, you can override the `get_related_filter` method of the admin. For example if you want to allow non-superusers to attach attachments only to articles they own you can use:

```
class AttachmentAdmin(ForeignKeyAutocompleteAdmin):

    ...

    def get_related_filter(self, model, request):
        user = request.user
        if not issubclass(model, Article) or user.is_superuser():
            return super(AttachmentAdmin, self).get_related_filter(
                model, request
            )
        return Q(owner=user)
```

Note that this does not protect your application from malicious attempts to circumvent it (e.g. sending fabricated requests via cURL).

4.3 Command Extensions

synopsis Command Extensions

4.3.1 shell_plus

synopsis Django shell with autoloading of the apps database models and subclasses of user-defined classes.

Interactive Python Shells

There is support for three different types of interactive python shells.

IPython:

```
$ ./manage.py shell_plus --ipython
```

bpython:

```
$ ./manage.py shell_plus --bpython
```

ptpython:

```
$ ./manage.py shell_plus --ptpython
```

Python:

```
$ ./manage.py shell_plus --plain
```

It is possible to directly add command line arguments to the underlying Python shell using `--`:

```
$ ./manage.py shell_plus --ipython -- --profile=foo
```

The default resolution order is: ptpython, bpython, ipython, python.

You can also set the configuration option SHELL_PLUS to explicitly specify which version you want.

```
# Always use IPython for shell_plus
SHELL_PLUS = "ipython"
```

It is also possible to use IPython Notebook, an interactive Python shell which uses a web browser as its user interface, as an alternative shell:

```
$ ./manage.py shell_plus --notebook
```

In addition to being savable, IPython Notebooks can be updated (while running) to reflect changes in a Django application's code with the menu command *Kernel* > *Restart*.

Configuration

Sometimes, models from your own apps and other people's apps have colliding names, or you may want to completely skip loading an app's models. Here are some examples of how to do that.

Note: These settings are only used inside shell_plus and will not affect your environment.

```
# Rename the automatic loaded module Messages in the app blog to blog_messages.
SHELL_PLUS_MODEL_ALIASES = {'blog': {'Messages': 'blog_messages'},}
```

```
# Prefix all automatically loaded models in the app blog with myblog.
SHELL_PLUS_APP_PREFIXES = {'blog': 'myblog',}
```

```
# Dont load the 'sites' app, and skip the model 'pictures' in the app 'blog'
SHELL_PLUS_DONT_LOAD = ['sites', 'blog.pictures']
```

```
# Dont load any models
SHELL_PLUS_DONT_LOAD = ['*']
```

You can also combine model_aliases and dont_load. When referencing nested modules, e.g. *somepackage.someapp.models.somemodel*, omit the package name and the reference to *models*. For example:

```
SHELL_PLUS_DONT_LOAD = ['someapp.somemodel', ]  # This works
SHELL_PLUS_DONT_LOAD = ['somepackage.someapp.models.somemodel', ]  # This does NOT␣
↪work
```

It is possible to ignore autoloaded modules when using manage.py, like:

```
$ ./manage.py shell_plus --dont-load app1 --dont-load app2.module1
```

Command line parameters and settings in the configuration file are merged, so you can safely append modules to ignore from the commandline for one-time usage.

Other configuration options include:

```
# Always use IPython for shell_plus
SHELL_PLUS = "ipython"
```

```
SHELL_PLUS_PRINT_SQL = True

# Truncate sql queries to this number of characters (this is the default)
SHELL_PLUS_PRINT_SQL_TRUNCATE = 1000

# To disable truncation of sql queries use
SHELL_PLUS_PRINT_SQL_TRUNCATE = None

# Specify sqlparse configuration options when printing sql queries to the console
SHELL_PLUS_SQLPARSE_FORMAT_KWARGS = dict(
  reindent_aligned=True,
  truncate_strings=500,
)

# Specify Pygments formatter and configuration options when printing sql queries to␣
↪the console
import pygments.formatters
SHELL_PLUS_PYGMENTS_FORMATTER = pygments.formatters.TerminalFormatter
SHELL_PLUS_PYGMENTS_FORMATTER_KWARGS = {}
```

```
# Additional IPython arguments to use
IPYTHON_ARGUMENTS = []

IPYTHON_KERNEL_DISPLAY_NAME = "Django Shell-Plus"
```

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```
# Additional Notebook arguments to use
NOTEBOOK_ARGUMENTS = []
NOTEBOOK_KERNEL_SPEC_NAMES = ["python3", "python"]
```

Collision resolvers

You don't have to worry about inaccessibility of models with conflicting names.

If you have conflicting model names, all conflicts can be resolved automatically. All models will be available under shell_plus, some of them with intuitive aliases.

This mechanism is highly configurable and you must only set `SHELL_PLUS_MODEL_IMPORTS_RESOLVER`. You should set full path to collision resolver class.

All predefined collision resolvers are in `django_extensions.collision_resolvers` module. Example:

```
SHELL_PLUS_MODEL_IMPORTS_RESOLVER = 'django_extensions.collision_resolvers.FullPathCR'
```

All collision resolvers searches for models with the same name.

If conflict is detected they decides, which model to choose. Some of them are creating aliases for all conflicting models.

Example

Suppose that we have two apps:

- programming(with models Language and Framework)
- workers(with models Language and Worker)

'workers' app is last in alphabetical order, but suppose that 'programming' app is occurs firstly in `INSTALLED_APPS`.

Collision resolvers won't change aliases for models Framework and Worker, because their names are unique. There are several types of collision resolvers:

LegacyCR

Default collision resolver. Model from last application in alphabetical order is selected:

```
from workers import Language
```

InstalledAppsOrderCR

Collision resolver which selects the first model from INSTALLED_APPS. You can set your own app priorities list subclassing him and overwriting `APP_PRIORITIES` field.

This collision resolver will select a model from the first app on this list. If both app's are absent on this list, resolver will choose a model from the first app in alphabetical order:

```
from programming import Language
```

FullPathCR

Collision resolver which transform full model name to alias by changing dots to underscores. He also removes 'models' part of alias, because all models are in models.py files.

Model from last application in alphabetical order is selected:

```
from programming import Language (as programming_Language)
from workers import Language, Language (as workers_Language)
```

AppNamePrefixCR

Collision resolver which transform pair (app name, model_name) to alias `{app_name}_{model_name}`. Model from last application in alphabetical order is selected.

Result is different than FullPathCR, when model has app_label other than current app:

```
from programming import Language (as programming_Language)
from workers import Language, Language (as workers_Language)
```

AppNameSuffixCR

Collision resolver which transform pair (app name, model_name) to alias `{model_name}_{app_name}`

Model from last application in alphabetical order is selected:

```
from programming import Language (as Language_programming)
from workers import Language, Language (as Language_workers)
```

AppNamePrefixCustomOrderCR

Collision resolver which is mixin of AppNamePrefixCR and InstalledAppsOrderCR.

In case of collisions he sets aliases like AppNamePrefixCR, but sets the default model using InstalledAppsOrderCR:

```
from programming import Language, Language (as programming_Language)
from workers import Language (as workers_Language)
```

AppNameSuffixCustomOrderCR

Collision resolver which is a mixin of AppNameSuffixCR and InstalledAppsOrderCR.

In case of collisions he sets aliases like AppNameSuffixCR, but sets the default model using InstalledAppsOrderCR:

```
from programming import Language, Language (as Language_programming)
from workers import Language (as Language_workers)
```

FullPathCustomOrderCR

Collision resolver which is a mixin of FullPathCR and InstalledAppsOrderCR.

In case of collisions he sets aliases like FullPathCR, but sets the default model using InstalledAppsOrderCR:

```
from programming import Language, Language (as programming_Language)
from workers import Language (as workers_Language)
```

AppLabelPrefixCR

Collision resolver which transform pair (app_label, model_name) to alias `{app_label}_{model_name}`

This is very similar to `AppNamePrefixCR` but this may generate shorter names in the case of apps nested into several namespace (like Django's auth app):

```
# with AppNamePrefixCR
from django.contrib.auth.models import Group (as django_contrib_auth_Group)

# with AppLabelPrefixCR
from django.contrib.auth.models import Group (as auth_Group)
```

AppLabelSuffixCR

Collision resolver which transform pair (app_label, model_name) to alias `{model_name}_{app_label}`

Similar idea as the above, but based on `AppNameSuffixCR`:

```
# with AppNamePrefixCR
from django.contrib.auth.models import Group (as Group_django_contrib_auth)

# with AppLabelSuffixCR
from django.contrib.auth.models import Group (as Group_auth)
```

Writing your custom collision resolver

You can customize models import behaviour by subclassing one of the abstract collision resolvers:

PathBasedCR

Abstract resolver which transforms full model name into alias. To use him you need to overwrite transform_import function which should have one parameter.

It will be a full model name. It should return valid alias as a str instance.

AppNameCR

Abstract collision resolver which transform pair (app name, model_name) to alias by changing dots to underscores.

You must define `MODIFICATION_STRING` which should be string to format with two keyword arguments: app_name and model_name. For example: `{app_name}_{model_name}`.

Model from last application in alphabetical order is selected.

You can mix PathBasedCR or AppNameCR with InstalledAppsOrderCR, but InstalledAppsOrderCR should be the second base class.

BaseCR

Abstract base collision resolver. All collision resolvers needs to inherit from this class.

To write a custom collision resolver you need to overwrite the resolve_collisions function. It receives `Dict[str, List[str]]` where key is model name and values are full model names (full model name means: module + model_name).

You should return `Dict[str, str]`, where key is model name and value is full model name.

Import Subclasses

If you want to load automatically all project subclasses of some base class, you can achieve this by setting `SHELL_PLUS_SUBCLASSES_IMPORT` option.

It must be a list of either classes or strings containing paths to these classes.

For example, if you want to load all your custom managers then you should provide:

```
from django.db.models import Manager
SHELL_PLUS_SUBCLASSES_IMPORT = [Manager]
```

Then shell_plus will load all your custom managers:

```
# Shell Plus Subclasses Imports
from utils.managers import AbstractManager
from myapp.managers import MyCustomManager
from somewhere.else import MyOtherManager
# django.db.models.Manager is not loaded because only project classes are.
```

By default, all subclasses of your base class from all projects modules will be loaded.

You can exclude some modules and all their submodules by passing `SHELL_PLUS_SUBCLASSES_IMPORT_MODULES_BLACKLIST` option:

```
SHELL_PLUS_SUBCLASSES_IMPORT_MODULES_BLACKLIST = ['utils', 'somewhere.else']
```

Elements of this list must be strings containing full modules paths. If these modules are excluded only `MyCustomManager` from `myapp.managers` will be loaded.

If you are using `SHELL_PLUS_SUBCLASSES_IMPORT` shell_plus loads all project modules for finding subclasses.

Sometimes it can lead to some errors(for example when we have an old unused module which contains syntax errors).

Excluding these modules can help avoid shell_plus crashes in some situations. It is recommended to exclude all `setup.py` files.

IPython Notebook

There are two settings that you can use to pass your custom options to the IPython Notebook in your Django settings.

The first one is `NOTEBOOK_ARGUMENTS` that can be used to hold those options that available via:

```
$ ipython notebook -h
```

For example:

```
NOTEBOOK_ARGUMENTS = [
    '--ip', 'x.x.x.x',
    '--port', 'xx',
]
```

Another one is `IPYTHON_ARGUMENTS` that for those options that available via:

```
$ ipython -h
```

The Django settings module and database models are auto-loaded into the interactive shell's global namespace also for IPython Notebook.

Auto-loading is done by a custom IPython extension which is activated by default by passing the `--ext django_extensions.management.notebook_extension` argument to the Notebook. If you need to pass custom options to the IPython Notebook, you can override the default options in your Django settings using the `IPYTHON_ARGUMENTS` setting. For example:

```
IPYTHON_ARGUMENTS = [
    '--ext', 'django_extensions.management.notebook_extension',
    '--ext', 'myproject.notebook_extension',
    '--debug',
]
```

To activate auto-loading, remember to either include the django-extensions' default notebook extension or copy its auto-loading code into your own extension.

Note that the IPython Notebook feature doesn't currently honor the `--dont-load` option.

Additional Imports

In addition to importing the models, you can specify other items to import by default. These can be specified with the settings `SHELL_PLUS_IMPORTS`, `SHELL_PLUS_PRE_IMPORTS` and `SHELL_PLUS_POST_IMPORTS`.

The order of import loading is as follows:

- `SHELL_PLUS_PRE_IMPORTS`
- Subclasses (if enabled)
- Models (if not disabled)
- Default Django imports (if not disabled)
- `SHELL_PLUS_IMPORTS`
- `SHELL_PLUS_POST_IMPORTS`

Example for in your `settings.py` file:

```
SHELL_PLUS_IMPORTS = [
    'from module.submodule1 import class1, function2',
    'from module.submodule2 import function3 as another1',
    'from module.submodule3 import *',
    'import module.submodule4',
]
```

These symbols will be available as soon as the shell starts.

Database application signature

If using PostgreSQL the `application_name` is set by default to `django_shell` to help identify queries made under shell_plus.

SQL queries

If the configuration option DEBUG is set to True, it is possible to print SQL queries as they're executed in shell_plus like:

```
$ ./manage.py shell_plus --print-sql
```

You can also set the configuration option SHELL_PLUS_PRINT_SQL to omit the above command line option.

```
# print SQL queries in shell_plus
SHELL_PLUS_PRINT_SQL = True
```

Printing SQL queries also comes with the possibility of specifying the maximum amount of characters to display:

    $ ./manage.py shell_plus –print-sql –truncate-sql

–truncate-sql accepts an int value starting from 0 (which disables truncation). Defaults to 1000.

You can also set the configuration option SHELL_PLUS_PRINT_SQL_TRUNCATE to omit the above command line option.

```
# print SQL queries in shell_plus
SHELL_PLUS_PRINT_SQL_TRUNCATE = None
```

4.3.2 create_template_tags

synopsis Creates a template tag directory structure within the specified application.

Usage

Create templatetags directory for *foobar* app:

```
$ python manage.py create_template_tags foobar
```

it will create directory structure:

```
foobar/
   __init__.py
   models.py
   templatetags/
      __init__.py
      foobar_tags.py
```

you can pass custom tags filename by providing `--name` argument:

```
$ python manage.py create_template_tags foobar --name custom_tags
```

4.3.3 delete_squashed_migrations

synopsis Deletes leftover migrations after squashing and converts squashed migration to a normal one.

Deletes leftover migrations after squashing and converts squashed migration to a normal one by removing the replaces attribute. This automates the clean up procedure outlined at the end of the Django migration squashing documentation. Modifies your source tree! Use with care!

Example Usage

With *django-extensions* installed you cleanup squashed migrations using the *delete_squashed_migrations* command:

```
# Delete leftover migrations from the first squashed migration found in myapp
$ ./manage.py delete_squashed_migrations myapp

# As above but non-interactive
$ ./manage.py --noinput delete_squashed_migrations myapp

# Explicitly specify the squashed migration to clean up
$ ./manage.py delete_squashed_migrations myapp 0001_squashed
```

4.3.4 dumpscript

synopsis Generates a standalone Python script that will repopulate the database using objects.

The *dumpscript* command generates a standalone Python script that will repopulate the database using objects. The advantage of this approach is that it is easy to understand, and more flexible than directly populating the database, or using XML.

Why?

There are a few benefits to this:

- less drama with model evolution: foreign keys handled naturally without IDs, new and removed columns are ignored
- edit script to create 1,000s of generated entries using for loops, generated names, python modules etc.

For example, an edited script can populate the database with test data:

```
for i in xrange(2000):
    poll = Poll()
    poll.question = "Question #%d" % i
    poll.pub_date = date(2001,01,01) + timedelta(days=i)
    poll.save()
```

Real databases will probably be bigger and more complicated so it is useful to enter some values using the admin interface and then edit the generated scripts.

Features

- *ForeignKey* and *ManyToManyFields* (using python variables, not object IDs)
- Self-referencing *ForeignKey* (and M2M) fields
- Sub-classed models
- *ContentType* fields and generic relationships
- Recursive references
- *AutoFields* are excluded
- Parent models are only included when no other child model links to it
- Individual models can be referenced

How?

To dump the data from all the models in a given Django app (*appname*):

```
$ ./manage.py dumpscript appname > scripts/testdata.py
```

To dump the data from just a single model (*appname.ModelName*):

```
$ ./manage.py dumpscript appname.ModelName > scripts/testdata.py
```

To reset a given app, and reload with the saved data:

```
$ ./manage.py reset appname
$ ./manage.py runscript testdata
```

Note: Runscript needs *scripts* to be a module, so create the directory and a *__init__.py* file.

Caveats

Naming conflicts

Please take care that when naming the output files these filenames do not clash with other names in your import path. For instance, if the appname is the same as the script name, an importerror can occur because rather than importing the application modules it tries to load the modules from the dumpscript file itself.

Examples:

```
# Wrong
$ ./manage.py dumpscript appname > dumps/appname.py

# Right
$ ./manage.py dumpscript appname > dumps/appname_all.py

# Right
$ ./manage.py dumpscript appname.Somemodel > dumps/appname_somemodel.py
```

4.3.5 RunScript

synopsis Runs a script in the Django context.

Introduction

The runscript command lets you run an arbitrary set of python commands within the Django context. It offers the same usability and functionality as running a set of commands in shell accessed by:

```
$ python manage.py shell
```

Getting Started

This example assumes you have followed the tutorial for Django 1.8+, and created a polls app containing a `Question` model. We will create a script that deletes all of the questions from the database.

To get started create a scripts directory in your project root, next to manage.py:

```
$ mkdir scripts
$ touch scripts/__init__.py
```

Note: The *__init__.py* file is necessary so that the folder is picked up as a python package.

Next, create a python file with the name of the script you want to run within the scripts directory:

```
$ touch scripts/delete_all_questions.py
```

This file must implement a *run()* function. This is what gets called when you run the script. You can import any models or other parts of your django project to use in these scripts.

For example:

```
# scripts/delete_all_questions.py

from polls.models import Question

def run():
    # Fetch all questions
    questions = Question.objects.all()
    # Delete questions
    questions.delete()
```

Note: You can put a script inside a *scripts* folder in any of your apps too.

Usage

To run any script you use the command *runscript* with the name of the script that you want to run.

For example:

```
$ python manage.py runscript delete_all_questions
```

Note: The command first checks for scripts in your apps i.e. *app_name/scripts* folder and runs them before checking for and running scripts in the *project_root/scripts* folder. You can have multiple scripts with the same name and they will all be run sequentially.

Passing arguments

You can pass arguments from the command line to your script by passing a space separated list of values with `--script-args`. For example:

```
$ python manage.py runscript delete_all_questions --script-args staleonly
```

The list of argument values gets passed as arguments to your *run()* function. For example:

```
# scripts/delete_all_questions.py
from datetime import timedelta

from django.utils import timezone

from polls.models import Question

def run(*args):
    # Get all questions
    questions = Question.objects.all()
    if 'staleonly' in args:
        # Only get questions more than 100 days old
        questions = questions.filter(pub_date__lt=timezone.now() -␣
↪timedelta(days=100))
    # Delete questions
    questions.delete()
```

Setting execution directory

You can set scripts execution directory using `--chdir` option or `settings.RUNSCRIPT_CHDIR`. You can also set scripts execution directory policy using `--dir-policy` option or `settings.`

`RUNSCRIPT_CHDIR_POLICY`.

It can be one of the following:

- **none** - start all scripts in current directory.
- **each** - start all scripts in their directories.
- **root** - start all scripts in `BASE_DIR` directory.

Assume this simplified directory structure:

```
django_project_dir/
├--first_app/
│  └-scripts/
│    ├-first_script.py
├--second_app/
│  └-scripts/
│    ├-second_script.py
├--manage.py
├--other_folder/
│  └-some_file.py
```

Assume you are in `other_folder` directory. You can set execution directory for both scripts using this command:

```
$ python ../manage.py runscript first_script second_script --chdir /django_project_
↪dir/second_app
# scripts will be executed from second_app directory
```

You can run both scripts with `NONE` policy using this command:

```
$ python ../manage.py runscript first_script second_script --dir-policy none
  # scripts will be executed from other_folder directory
```

You can run both scripts with `EACH` policy using this command:

```
$ python ../manage.py runscript first_script second_script --dir-policy each
  # first_script will be executed from first_app and second script will be executed␣
↪from second_app
```

You can run both scripts with `ROOT` policy using this command:

```
$ python ../manage.py runscript first_script second_script --dir-policy root
  # scripts will be executed from django_project_dir directory
```

Errors and exit codes

If an exception is encountered the execution of the scripts will stop, a traceback is shown and the command will return an exit code.

To control the exit-code you can either use *CommandError("something went terribly wrong", returncode=123)* in your script or has the *run(...)* function return the exit_code. Where any exit code other then 0 will indicate failure, just like regular shell commands.

This means you can use *runscript* in your CI/CD pipelines or other automated scripts and it should behave like any other shell command.

Continue on errors

If you want runscript to continue running scripts even if errors occurs you can set *-c*:

```
$ python manage.py runscript delete_all_questions another_script --continue-on-error
```

This will continue running 'another_script' even if an exception was raised or exit code was returned in 'delete_all_questions'.

When all the scripts has been run *runscript* will exit with the last non-zero exit code.

Note: It is possible to do *raise CommandError(..., returncode=0)* which will lead to an exception with exit code 0.

Debugging

If an exception occurs you will get a traceback by default. You can use *CommandError* in the same way as with other custom management commands.

To get a traceback from a *CommandError* specify `--traceback`. For example:

```
$ python manage.py runscript delete_all_questions --traceback
```

If you do not want to see tracebacks at all you can specify:

```
$ python manage.py runscript delete_all_questions --no-traceback
```

4.3.6 export_emails

synopsis export the email addresses for your users in one of many formats

Most Django sites include a registered user base. There are times when you would like to import these e-mail addresses into other systems (generic mail program, Gmail, Google Docs invites, give edit permissions, LinkedIn Group pre-approved listing, etc.). The export_emails command extension gives you this ability. Exported users can be filtered by Group name association.

Example Usage

```
# Export all the addresses in the '"First Last" <my@addr.com>;' format.
$ ./manage.py export_emails > addresses.txt
```

```
# Export users from the group 'Attendees' in the linked in pre-approve Group csv␣
↪format.
$ ./manage.py export_emails -g Attendees -f linkedin pycon08.csv
```

```
# Create a csv file importable by Gmail or Google Docs
$ ./manage.py export_emails --format=google google.csv
```

Supported Formats

address

This is the default basic text format. Each entry is on its own line in the format:

```
"First Last" <user@host.com>;
```

This can be used with all known mail programs (that I know about anyway).

google

A CSV (comma separated value) format which Google applications can import. This can be used to import directly into Gmail, a Gmail mailing group, Google Docs invite (to read), Google Docs grant edit permissions, Google Calendar invites, etc.

Only two columns are supplied. One for the person's name and one for the email address. This is also nice for importing into spreadsheets.

outlook

A CSV (comma separated value) format which Outlook can parse and import. Supplies all the columns that Outlook 'requires', but only the name and email address are supplied.

linkedin

A CSV (comma separated value) format which can be imported by LinkedIn Groups to pre-approve a list of people for joining the group.

This supplies 3 columns: first name, last name, and email address. This is the best generic csv file for importing into spreadsheets as well.

vcard

A vCard format which Apple Address Book can parse and import.

Settings

There are a couple of settings keys which can be configured in *settings.py*. Below the default values are shown:

```
EXPORT_EMAILS_ORDER_BY = ['last_name', 'first_name', 'username', 'email']
EXPORT_EMAILS_FIELDS = ['last_name', 'first_name', 'username', 'email']
EXPORT_EMAILS_FULL_NAME_FUNC = None
```

EXPORT_EMAILS_ORDER_BY

Specifies the *order_by(...)* clause on the query being done into the database to retrieve the users. This determines the order of the output.

EXPORT_EMAILS_FIELDS

Specifies which fields will be selected from the database. This is most useful in combination with *EXPORT_EMAILS_FULL_NAME_FUNC* to select other fields you might want to use inside the custom function or when using a custom User model which does not have fields like 'first_name' and 'last_name'.

EXPORT_EMAILS_FULL_NAME_FUNC

A function to use to create a full name based on the database fields selected by *EXPORT_EMAILS_FULL_NAME_FUNC*. The default implementation can be looked up in https://github.com/django-extensions/django-extensions/blob/master/django_extensions/management/commands/export_emails.py#L23

4.3.7 generate_password

synopsis Generates a new password that can be used for a user password.

Introduction

This is a handy command to generate a new password which can be used for a user password. This uses Django core's default password generator `django.contrib.auth.base_user.BaseUserManager.make_random_password()` to generate a password.

You can specify the length of password with the option `--length`. If you don't specify `--length`, the default value of `make_random_password()` is applied.

Usage

Run

```
$ python manage.py generate_password  [--length=<length>]
```

4.3.8 Graph models

synopsis Renders a graphical overview of your project or specified apps.

Creates a GraphViz dot file for the specified app names based on their models.py. You can pass multiple app names and they will all be combined into a single model. Output is usually directed to a dot file.

Several options are available: grouping models, including inheritance, excluding models and columns, and changing the layout when rendering to an output image.

With the latest revisions it's also possible to specify an output file if pygraphviz is installed and render directly to an image or other supported file-type.

Selecting a library

You need to select the library to generate the image. You can do so by passing the –pygraphviz or –pydot parameter, depending on which library you want to use.

When neither of the command line parameters are given the default is to try and load pygraphviz or pydot (in that order) to generate the image.

To install pygraphviz you usually need to run this command:

```
$ pip install pygraphviz
```

It is possible you can't install it because it needs some C extensions to build. In that case you can try other methods to install or you can use PyDot.

To install pydot you need to run this command:

```
$ pip install pyparsing pydot
```

Installation should be fast and easy. Remember to install this exact version of pyparsing, otherwise it's possible you get this error:

> Couldn't import dot_parser, loading of dot files will not be possible.

Default Settings

The option GRAPH_MODELS = {} can be used in the settings file to specify default options:

```
GRAPH_MODELS = {
  'all_applications': True,
  'group_models': True,
}
```

It uses the same names as on the command line only with the leading two dashes removed and the other dashes replaced by underscores. You can specify a list of applications with the *app_labels* key:

```
GRAPH_MODELS = {
  'app_labels': ["myapp1", "myapp2", "auth"],
}
```

Templates

Django templates are used to generate the dot code. This in turn can be drawn into a image by libraries like *pygraphviz* or *pydot*. You can extend or override the templates if needed.

Templates used:

- django_extensions/graph_models/digraph.dot
- django_extensions/graph_models/label.dot
- django_extensions/graph_models/relation.dot

Documentation on how to create dot files can be found here: https://www.graphviz.org/documentation/

Warning: Modifying Django's default templates behaviour might break *graph_models*

Please be aware that if you use any *template_loaders* or extensions that change the way templates are rendered that this can cause *graph_models* to fail.

An example of this is the Django app *django-template-minifier* this automatically removed the newlines before/after template tags even for non-HTML templates which leads to a malformed file.

Example Usage

With *django-extensions* installed you can create a dot-file or an image by using the *graph_models* command:

```
# Create a dot file
$ ./manage.py graph_models -a > my_project.dot
```

```
# Create a PNG image file called my_project_visualized.png with application grouping
$ ./manage.py graph_models -a -g -o my_project_visualized.png

# Same example but with explicit selection of pygraphviz or pydot
$ ./manage.py graph_models --pygraphviz -a -g -o my_project_visualized.png
$ ./manage.py graph_models --pydot -a -g -o my_project_visualized.png
```

```
# Create a dot file for only the 'foo' and 'bar' applications of your project
$ ./manage.py graph_models foo bar > my_project.dot
```

```
# Create a graph for only certain models
$ ./manage.py graph_models -a -I Foo,Bar -o my_project_subsystem.png
```

```
# Create a graph excluding certain models
$ ./manage.py graph_models -a -X Foo,Bar -o my_project_sans_foo_bar.png
```

```
# Create a graph including models matching a given pattern and excluding some of them
# It will first select the included ones, then filter out the ones to exclude
$ ./manage.py graph_models -a -I Product* -X *Meta -o my_project_products_sans_meta.
↪png
```

```
# Create a graph without showing its edges' labels
$ ./manage.py graph_models -a --hide-edge-labels -o my_project_sans_foo_bar.png
```

```
# Create a graph with 'normal' arrow shape for relations
$ ./manage.py graph_models -a --arrow-shape normal -o my_project_sans_foo_bar.png
```

```
# Create a graph with colored edges for relations with on_delete settings
$ ./manage.py graph_models -a --color-code-deletions -o my_project_colored.png
```

```
# Create a graph with different layout direction,
# supported directions: "TB", "LR", "BT", "RL"
$ ./manage.py graph_models -a --rankdir BT -o my_project_sans_foo_bar.png
```

4.3.9 list_model_info

synopsis Lists out all the fields and methods for models in installed apps.

Introduction

When working with large projects or when returning to a code base after some time away, it can be challenging to remember all of the fields and methods associated with your models. This command makes it easy to see:

- what fields are available
- how they are referred to in queries
- each field's class
- each field's representation in the database
- what methods are available
- method signatures

Commandline arguments

You can configure the output in a number of ways.

```
# Show each field's class
$ ./manage.py list_model_info --field-class
```

```
# Show each field's database type representation
$ ./manage.py list_model_info --db-type
```

```
# Show each method's signature
$ ./manage.py list_model_info --signature
```

```
# Show all model methods, including private methods and django's default methods
$ ./manage.py list_model_info --all-methods
```

```
# Output only information for a single model, specifying the app and model using dot␣
↪notation
$ ./manage.py list_model_info --model users.User
```

You can combine arguments. for instance, to list all methods and show the method signatures for the User model within the users app:

```
$ ./manage.py list_model_info --all --signature --model users.User
```

Settings Configuration

You can specify default values in your settings.py to simplify running this command.

Tip: Commandline arguments override the following settings, allowing you to change options on the fly.

To show each field's class:

```
MODEL_INFO_FIELD_CLASS = True
```

To show each field's database type representation:

```
MODEL_INFO_DB_TYPE = True
```

To show each method's signature:

```
MODEL_INFO_SIGNATURE = True
```

To show all model methods, including private methods and django's default methods:

```
MODEL_INFO_ALL_METHODS = True
```

To output only information for a single model, specify the app and model using dot notation:

```
MODEL_INFO_MODEL = 'users.User'
```

4.3.10 list_signals

synopsis Lists all signals defined in the project grouped by model and signal type

Example Usage

With *django-extensions* installed you can review all defined handlers using *list_signals* command:

```
# As above but non-interactive
$ ./manage.py list_signals
```

4.3.11 managestate

synopsis Saves current applied migrations to a file or applies migrations from this file.

The *managestate* command fetches last applied migrations from a specified database and saves them to a specified file. After that, you may easily apply saved migrations. The advantage of this approach is that you may have at hand several database states and quickly switch between them.

Why?

While you develop several features or fix some bugs at the same time you often meet the situation when you need to apply or unapply database migrations before you check out to another feature/bug branch. You always need to view current migrations by *showmigrations*, then apply or unapply it manually using *migrate* and there is no problem if you work with one Django app. But when there is more than one, it starts to annoy. To forget about the problem and quickly switch between branches use the *managestate* command.

How?

To dump current migrations use:

```
$ ./manage.py managestate dump
```

A state will be saved to *managestate.json* just about the following:

```
{
  "default": {
    "admin": "0003_logentry_add_action_flag_choices",
    "auth": "0012_alter_user_first_name_max_length",
    "contenttypes": "0002_remove_content_type_name",
    "sessions": "0001_initial",
    "sites": "0002_alter_domain_unique",
    "myapp": "zero"
  },
  "updated_at": "2021-06-27 10:42:50.364070"
}
```

As you see, migrations have been saved as the state called “default”. You can specify it using the positional argument:

```
$ ./manage.py managestate dump my_feature_branch
```

Then migrations will be added to *managestate.json* under the key "my_feature_branch". To change the filename use *-f* or *–filename* flag.

When you load a state from a file, you may also use all arguments defined for the *migrate* command.

Examples

Save an initial database state of the branch "master/main" before developing features:

```
$ ./manage.py managestate dump master
```

Check out to your branch, develop your feature, and dump its state when you are going to get reviewed:

```
$ ./manage.py managestate dump super-feature
```

Check out to the "master" branch back and rollback a database state with just one command:

```
$ ./manage.py managestate load master
```

If you need to add some improvements to your feature, just use:

```
$ ./manage.py managestate load super-feature
```

4.3.12 merge_model_instances

synopsis Merges duplicate model instances by reassigning related model references to a chosen primary model instance.

Note: This management command is in beta. Use with care, and make sure to test thoroughly before implementing.

Allows the user to choose a model to de-duplicate and a field on which to de-duplicate model instances. Provides an interactive session with the user to select the model to de-duplicate and the field on which to de-duplicate model instances. After merging model instances to one instance, deletes the merged model instances. Use with care!

Example Usage

With *django-extensions* installed you merge model instances using the *merge_model_instances* command:

```
# Delete leftover migrations from the first squashed migration found in myapp
$ ./manage.py merge_model_instances
```

4.3.13 print_settings

synopsis Django management command similar to `diffsettings` but shows *selected* active Django settings or *all* if no args passed.

Introduction

Django comes with a `diffsettings` command that shows how your project's settings differ from the Django defaults. Sometimes it is useful to just see the settings that are in effect for your project. This is particularly true if you have a more complex system for settings than just a single `settings.py` file. For example, you might have settings files that import other settings file, such as dev, test, and production settings files that source a base settings file.

This command also supports dumping the data in a few different formats.

More Info

The simplest way to run it is with no arguments:

```
$ python manage.py print_settings
```

Some variations:

```
$ python manage.py print_settings --format=json
$ python manage.py print_settings --format=yaml    # Requires PyYAML
$ python manage.py print_settings --format=pprint
$ python manage.py print_settings --format=text
$ python manage.py print_settings --format=value
```

Show just selected settings:

```
$ python manage.py print_settings DEBUG INSTALLED_APPS
$ python manage.py print_settings DEBUG INSTALLED_APPS --format=pprint
$ python manage.py print_settings INSTALLED_APPS --format=value
```

It is also possible to use shell-style wildcards:

```
$ python manage.py print_settings TIME*
$ python manage.py print_settings *_DIRS STATIC*
$ python manage.py print_settings INSTALLED_????
```

Yielding an error when a settings does not exist:

```
$ ./manage.py print_settings -f INSTALLED_APPZ
CommandError: INSTALLED_APPZ not found in settings.
```

For more info, take a look at the built-in help:

```
$ python manage.py print_settings --help
usage: manage.py print_settings [-h] [-f] [--format FORMAT] [--indent INDENT] [--
↪version] [-v {0,1,2,3}]
                                [--settings SETTINGS] [--pythonpath PYTHONPATH] [--
↪traceback] [--no-color]
                                [--force-color] [--skip-checks]
                                [setting [setting ...]]

Print the active Django settings.

positional arguments:
  setting               Specifies setting to be printed.

optional arguments:
  -h, --help            show this help message and exit
  -f, --fail            Fail if invalid setting name is given.
  --format FORMAT       Specifies output format.
  --indent INDENT       Specifies indent level for JSON and YAML
  --version             show program's version number and exit
  -v {0,1,2,3}, --verbosity {0,1,2,3}
                        Verbosity level; 0=minimal output, 1=normal output, 2=verbose␣
↪output, 3=very verbose output
```

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```
  --settings SETTINGS   The Python path to a settings module, e.g. "myproject.
↪settings.main". If this isn't provided,
                        the DJANGO_SETTINGS_MODULE environment variable will be used.
  --pythonpath PYTHONPATH
                        A directory to add to the Python path, e.g. "/home/
↪djangoprojects/myproject".
  --traceback           Raise on CommandError exceptions
  --no-color            Don't colorize the command output.
  --force-color         Force colorization of the command output.
  --skip-checks         Skip system checks.
```

4.3.14 reset_db

synopsis Fully resets your database by running DROP DATABASE and CREATE DATABASE

Django command that resets your Django database, removing all data from all tables. This allows you to run all migrations again.

By default the command will prompt you to confirm that all data will be deleted. This can be turned off with the `--noinput`-argument.

Supported engines

The command detects whether you're using a SQLite, MySQL, or Postgres database by looking up your Django database engine in the following lists.

```
DEFAULT_SQLITE_ENGINES = (
    'django.db.backends.sqlite3',
    'django.db.backends.spatialite',
)
DEFAULT_MYSQL_ENGINES = (
    'django.db.backends.mysql',
    'django.contrib.gis.db.backends.mysql',
    'mysql.connector.django',
)
DEFAULT_POSTGRESQL_ENGINES = (
    'django.db.backends.postgresql',
    'django.db.backends.postgresql_psycopg2',
    'django.db.backends.postgis',
    'django.contrib.gis.db.backends.postgis',
    'psqlextra.backend',
    'django_zero_downtime_migrations.backends.postgres',
    'django_zero_downtime_migrations.backends.postgis',
)
```

If the engine you're using is not listed above, check the optional settings section below.

Example Usage

```
# Reset the DB so that it contains no data and migrations can be run again
$ ./manage.py reset_db mybucket
```

```
# Don't ask for a confirmation before doing the reset
$ ./manage.py reset_db --noinput
```

```
# Use a different user and password than the one from settings.py
$ ./manage.py reset_db --user db_root --password H4rd2Guess
```

Optional settings

It is possible to use a Django DB engine not in the lists above – to do that add the approriate setting as shown below to your Django settings file:

```
# settings.py
DJANGO_EXTENSIONS_RESET_DB_SQLITE_ENGINES = ['your_custom_sqlite_engine']
DJANGO_EXTENSIONS_RESET_DB_MYSQL_ENGINES = ['your_custom_mysql_engine']
DJANGO_EXTENSIONS_RESET_DB_POSTGRESQL_ENGINES = ['your_custom_postgres_engine']
```

4.3.15 RunProfileServer

We recommend that before you start profiling any language or framework you learn enough about it so that you feel comfortable with digging into its internals.

Without sufficient knowledge it will not only be (very) hard but you're likely to make wrong assumptions (and fixes). As a rule of thumb, clean, well written code will help you a lot more than overzealous micro-optimizations will.

This document is work in progress. If you feel you can help with better/clearer or additional information about profiling Django please leave a comment.

Introduction

runprofileserver starts Django's runserver command with hotshot/profiling tools enabled. It will save .prof files containing the profiling information into the –prof-path directory. Note that for each request made one profile data file is saved.

By default the profile-data-files are saved in /tmp use the –prof-path option to specify your own target directory. Saving the data in a meaningful directory structure helps to keep your profile data organized and keeps /tmp uncluttered. (Yes this probably malfunctions systems such as Windows where /tmp does not exist)

To define profile filenames use –prof-file option. Default format is "{path}.{duration:06d}ms.{time}" (Python Format Specification is used).

Examples:

- "{time}-{path}-{duration}ms" - to order profile-data-files by request time
- "{duration:06d}ms.{path}.{time}" - to order by request duration

Profiler choice

runprofileserver supports two profilers: *hotshot* and *cProfile*. Both come with the standard Python library but *cProfile* is more recent and may not be available on all systems. For this reason, *hotshot* is the default profiler.

However, *hotshot* is not maintained anymore and using *cProfile* is usually the recommended way. If it is available on your system, you can use it with the option `--use-cprofile`.

Example:

```
$ mkdir /tmp/my-profile-data
$ ./manage.py runprofileserver --use-cprofile --prof-path=/tmp/my-profile-data
```

If you used the default profiler but are not able to open the profiling results with the `pstats` module or with your profiling GUI of choice because of an error "*ValueError: bad marshal data (unknown type code)*", try using *cProfile* instead.

KCacheGrind

Recent versions of *runprofileserver* have an option to save the profile data into a KCacheGrind compatible format. So you can use the excellent KCacheGrind tool for analyzing the profile data.

Example:

```
$ mkdir /tmp/my-profile-data
$ ./manage.py runprofileserver --kcachegrind --prof-path=/tmp/my-profile-data
Validating models...
0 errors found

Django version X.Y.Z, using settings 'complete_project.settings'
Development server is running at http://127.0.0.1:8000/
Quit the server with CONTROL-C.
[13/Nov/2008 06:29:38] "GET / HTTP/1.1" 200 41107
[13/Nov/2008 06:29:39] "GET /site_media/base.css?743 HTTP/1.1" 200 17227
[13/Nov/2008 06:29:39] "GET /site_media/logo.png HTTP/1.1" 200 3474
[13/Nov/2008 06:29:39] "GET /site_media/jquery.js HTTP/1.1" 200 31033
[13/Nov/2008 06:29:39] "GET /site_media/heading.png HTTP/1.1" 200 247
[13/Nov/2008 06:29:39] "GET /site_media/base.js HTTP/1.1" 200 751
<ctrl-c>
$ kcachegrind /tmp/my-profile-data/root.12574391.592.prof
```

Links

- https://code.djangoproject.com/wiki/ProfilingDjango
- https://rk.edu.pl/en/django-profiling-hotshot-and-kcachegrind/
- https://simonwillison.net/2008/May/22/debugging/

4.3.16 RunServerPlus

synopsis RunServerPlus-typical runserver with Werkzeug debugger baked in

Introduction

This item requires that you have the *Werkzeug WSGI utilities* installed. Included with Werkzeug is a kick ass debugger that renders nice debugging tracebacks and adds an AJAX based debugger (which allows code execution in the context of the traceback's frames). Additionally it provides a nice access view to the source code.

Getting Started

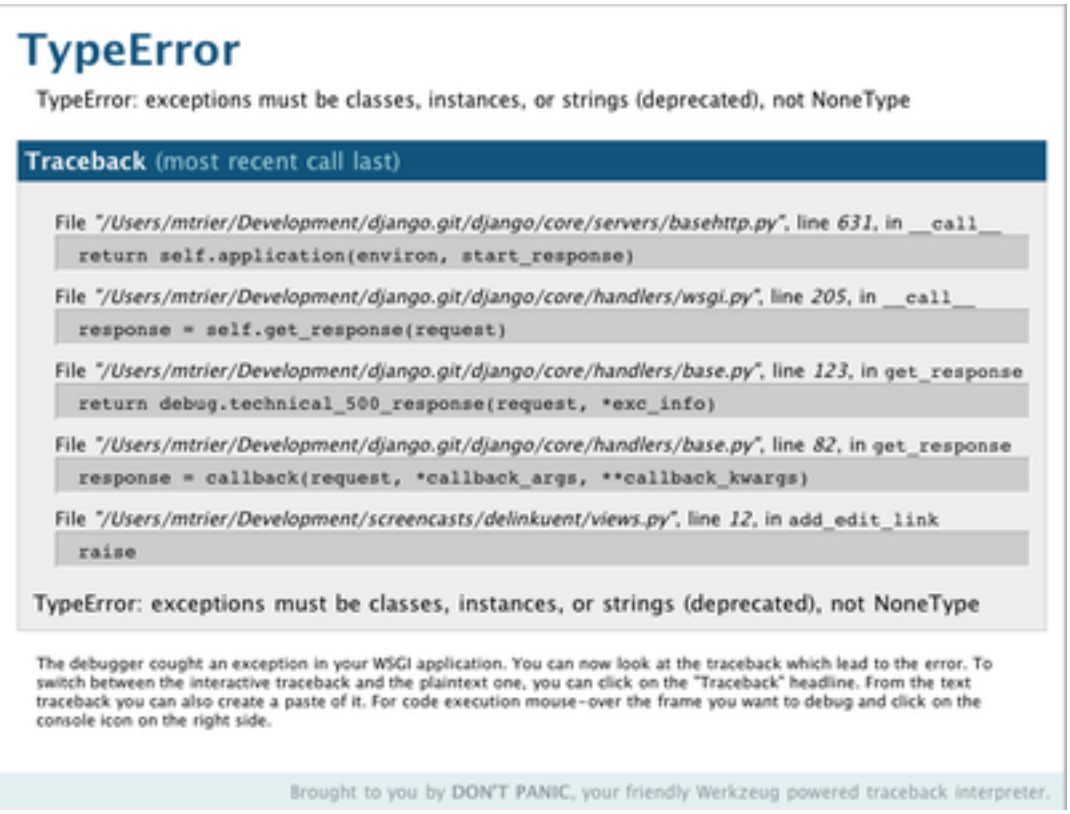
To get started we just use the *runserver_plus* command instead of the normal *runserver* command:

```
$ python manage.py runserver_plus

* Running on http://127.0.0.1:8000/
* Restarting with reloader...

Validating models...
0 errors found

Django version X.Y.Z, using settings 'screencasts.settings'
Development server is running at http://127.0.0.1:8000/
Using the Werkzeug debugger (https://werkzeug.palletsprojects.com/)
Quit the server with CONTROL-C.
```

Note: all normal runserver options apply. In other words, if you need to change the port number or the host information, you can do so like you would normally.

Usage

Instead of the default Django traceback page, the Werkzeug traceback page will be shown when an exception occurs.



Along with the typical traceback information we have a couple of options. These options appear when hovering over a particular traceback line. Notice that two buttons appear to the right:

The options are:

View Source

This displays the source underneath the traceback:

Being able to view the source file is handy because it provides more context information around the error. The actual traceback areas are highlighted so they are easy to spot.

One awkward aspect of the UI is that the page is not scrolled to the bottom. At first I thought nothing was happening because of this.

Interactive Debugging Console

Clicking on this button opens up a new pane under the traceback line you're on. This is the money shot:

An ajax based console appears in the pane and you can start debugging. Notice in the screenshot above I did a *print environ* to see what was in the environment parameter coming into the function.

WARNING: This should *never* be used in any kind of production environment. Not even for a quick problem check. I cannot emphasize this enough. The interactive debugger allows you to evaluate python code right against the server. You've been warned.

SSL

runserver_plus also supports SSL, so that you can easily debug bugs that pop up when https is used. To use SSL simply provide a file name for certificates; a key and certificate file will be automatically generated:

```
$ python manage.py runserver_plus --cert-file cert.crt
Validating models...
0 errors found

Django version X.Y.Z, using settings 'mysite.settings'
Development server is running at http://127.0.0.1:8000/
Using the Werkzeug debugger (https://werkzeug.palletsprojects.com/)
Quit the server with CONTROL-C.
 * Running on https://127.0.0.1:8000/
 * Restarting with reloader
Validating models...
0 errors found

Django version X.Y.Z, using settings 'mysite.settings'
Development server is running at http://127.0.0.1:8000/
Using the Werkzeug debugger (https://werkzeug.palletsprojects.com/)
Quit the server with CONTROL-C.
```

After running this command, your web application can be accessed through https://127.0.0.1:8000.

You will also find that two files are created in the current working directory: a key file and a certificate file. If you run the above command again, these certificate files will be reused so that you do not have to keep accepting the self-generated certificates from your browser every time. You can also provide a specific file for the certificate to be used if you already have one:

```
$ python manage.py runserver_plus --cert-file /tmp/cert.crt
```

Note that you need the OpenSSL library to use SSL, and Werkzeug 0.9 or later if you want to reuse existing certificates.

To install OpenSSL:

```
$ pip install pyOpenSSL
```

Certificates paths

You can configure different paths to .crt and .key files. At least one of `--cert-file` or `--key-file` must be defined to use SSL.

You can set path to .crt file using `--cert-file` option or deprecated `--cert` option which is currently an alias for `--cert-file`. If this option is not set than runserver_plus assumes that, this file is in the same directory as file from `--key-file` option.

You can set path to .key file using `--key-file` option. If this option is not set than runserver_plus assumes that, this file is in the same directory as file from `--cert-file` option.

If you want to create new files, than you can pass file name without extension. Proper files with this name and .crt and .key extensions will be created.

Configuration

The *RUNSERVERPLUS_SERVER_ADDRESS_PORT* setting can be configured to specify which address and port the development server should bind to.

If you find yourself frequently starting the server with:

```
$ python manage.py runserver_plus 0.0.0.0:8000
```

You can use settings to automatically default your development to an address/port:

```
RUNSERVERPLUS_SERVER_ADDRESS_PORT = '0.0.0.0:8000'
```

To ensure Werkzeug can log to the console, you may need to add the following to your settings:

```
LOGGING = {
    ...
    'handlers': {
        ...
        'console': {
            'level': 'DEBUG',
            'class': 'logging.StreamHandler',
        },
    },
    'loggers': {
        ...
        'werkzeug': {
            'handlers': ['console'],
            'level': 'DEBUG',
            'propagate': True,
        },
    },
}
```

Other configuration options and their defaults include:

```
# Truncate SQL queries to this many characters (None means no truncation)
RUNSERVER_PLUS_PRINT_SQL_TRUNCATE = 1000

# After how many seconds auto-reload should scan for updates in poller-mode
RUNSERVERPLUS_POLLER_RELOADER_INTERVAL = 1

# Werkzeug reloader type [auto, watchdog, or stat]
RUNSERVERPLUS_POLLER_RELOADER_TYPE = 'auto'

# Add extra files to watch
RUNSERVER_PLUS_EXTRA_FILES = []

# Do not watch files matching any of these patterns
RUNSERVER_PLUS_EXCLUDE_PATTERNS = []
```

IO Calls and CPU Usage

As noted in gh625 *runserver_plus* can be seen to use a lot of CPU and generate many I/O when idle.

This is due to the way Werkzeug has implemented the auto reload capability. It supports two ways of doing auto reloading either via *stat polling* or *file system events*.

The *stat polling* approach is pretty brute force and continously issues *stat* system calls which causes the CPU and IO load.

If possible try to install the Watchdog package, this should automatically cause Werkzeug to use *file system events* whenever possible.

You can read more about this in Werkzeug documentation

You can also increase the poll interval when using *stat polling* from the default of 1 second. This will decrease the CPU load at the expense of file edits taking longer to pick up.

This can be set two ways, in the django settings file:

```
RUNSERVERPLUS_POLLER_RELOADER_INTERVAL = 5
```

or as a commad line argument:

```
$ python manage.py runserver_plus --reloader-interval 5
```

Debugger PIN

> The following text about the debugger PIN is taken verbatim from the Werkzeug documentation about its debugger PIN.

Starting with Werkzeug 0.11 the debugger is additionally protected by a PIN. This is a security helper to make it less likely for the debugger to be exploited in production as it has happened to people to keep the debugger active. The PIN based authentication is enabled by default.

When the debugger comes up, on first usage it will prompt for a PIN that is printed to the command line. The PIN is generated in a stable way that is specific to the project. In some situations it might be not possible to generate a stable PIN between restarts in which case an explicit PIN can be provided through the environment variable WERKZEUG_DEBUG_PIN. This can be set to a number and will become the PIN. This variable can also be set to the value off to disable the PIN check entirely.

The PIN can also be disabled by passing the argument `--nopin` when calling the runserver_plus command.

If the PIN is entered too many times incorrectly the server needs to be restarted.

This feature is not supposed to entirely secure the debugger. It's intended to make it harder for an attacker to exploit the debugger. Never enable the debugger in production.

4.3.17 sync_s3

> **synopsis** sync your MEDIA_ROOT and STATIC_ROOT folders to S3

Django command that scans all files in your settings.MEDIA_ROOT and settings.STATIC_ROOT folders, then uploads them to S3 with the same directory structure.

This command can optionally do the following but it is off by default:

- gzip compress any CSS and Javascript files it finds and adds the appropriate 'Content-Encoding' header.
- set a far future 'Expires' header for optimal caching.
- upload only media or static files.
- use any other provider compatible with Amazon S3.
- set other than 'public-read' ACL.

Example Usage

```
# Upload files to S3 into the bucket 'mybucket'
$ ./manage.py sync_s3 mybucket
```

```
# Upload files to S3 into the bucket 'mybucket' and enable gzipping CSS/JS files and␣
↪setting of a far future expires header
$ ./manage.py sync_s3 mybucket --gzip --expires
```

```
# Upload only media files to S3 into the bucket 'mybucket'
$ ./manage.py sync_s3 mybucket  --media-only  # or --static-only
```

```
# Upload only media files to a S3 compatible provider into the bucket 'mybucket' and␣
↪set private file ACLs
$ ./manage.py sync_s3 mybucket  --media-only  --s3host=cs.example.com --acl=private
```

Required libraries and settings

This management command requires the boto library and was tested with version 1.4c:

https://github.com/boto/boto

It also requires an account with Amazon Web Services (AWS) and the AWS S3 keys. Bucket name is required and cannot be empty. The keys and bucket name are added to your settings.py file, for example:

```
# settings.py
AWS_ACCESS_KEY_ID = ''
AWS_SECRET_ACCESS_KEY = ''
AWS_BUCKET_NAME = 'bucket'
```

Optional settings

It is possible to customize sync_s3 directly from django settings file, for example:

```
# settings.py
AWS_S3_HOST = 'cs.example.com'
AWS_DEFAULT_ACL = 'private'
SYNC_S3_PREFIX = 'some_prefix'
FILTER_LIST = 'dir1, dir2'
AWS_CLOUDFRONT_DISTRIBUTION = 'E27LVI50CSW06W'
SYNC_S3_RENAME_GZIP_EXT = '.gz'
```

4.3.18 syncdata

synopsis Makes the current database have the same data as the fixture(s), no more, no less.

Introduction

Django command similar to 'loaddata' but also deletes. After 'syncdata' has run, the database will have the same data as the fixture - anything missing will be added, anything different will be updated, and anything extra will be deleted.

Usage

Tip: Command will loop over *fixtures* inside installed apps and pathes defined in `FIXTURE_DIRS`.

Assuming that you've got sample.json under *fixtures* directory in one of your `INSTALLED_APPS`:

```
$ python manage.py syncdata sample.json
```

If you want to keep old records use `--skip-remove` option:

```
$ python manage syncdata sample.xml --skip-remove
```

You can provide full path to your fixtures file like:

```
$ python manage syncdata /var/fixtures/sample.json
```

4.3.19 sqldiff

synopsis Prints the ALTER TABLE statements for the given appnames.

Django command that scans all models for the given appnames and compares their database schema with the real database tables.

It indicates how columns in the database are different from the SQL that would be generated by Django. This command is not a database migration tool, though it might certainly be of help during migrations. Its purpose is to show the current differences as a way to check or debug your models compared to the real database tables and columns.

Supported Databases

Currently the following databases are supported:

- PostgreSQL
- Sqlite3
- MySQL
- Oracle

Patches to support other databases are welcome! :-)

Exit Codes

Exit status is 0 if inputs are the same, 1 if different, 2 if trouble.

Example Usage

```
# View SQL differences for all installed applications
$ ./manage.py sqldiff -a
```

```
# View SQL differences for all installed applications using text instead of SQL
$ ./manage.py sqldiff -a -t
```

4.3.20 sqlcreate

synopsis Helps you setup your database(s) more easily

Introduction

Stop creating databases by hand. Your settings.py file already contains the correct information, so DRY.

Usage

$ python manage.py sqlcreate [–database=<databasename>] | <my_database_shell_command>

It will spit out SQL which you can review (if you want). Ultimately you want to pipe it into the database shell command of your choice.

If there were a good way to ensure that the user in the database settings had the proper permissions, we could submit the commands straight to the database. However, due to the nature of this portion of the project setup, that will never happen.

Example

PostgreSQL

$ ./manage.py sqlcreate [–database=<databasename>] | psql -U <db_administrator> -W

Note: If *USER* or *PASSWORD* are empty string or None, the *sqlcreate* assumes that unix domain socket connection mode is being used, and because of that the SQL clauses *CREATE USER* and privilege grants to the database and database user are not generated.

MySQL

$ ./manage.py sqlcreate [–database=<databasename>] | mysql -u <db_administrator> -p

Known Issues

- CREATE DATABASE is not SQL standard so might not work everywhere.
- When using fallback user is not created and password is not set. But it does try to do a GRANT to the database user.
- Missing options for tablespaces, etc.

4.3.21 sqldsn

synopsis Prints Data Source Name connection string on stdout

Supported Databases

Currently the following databases are supported:

- PostgreSQL (psycopg2, psycopg3, or postgis)
- Sqlite3
- MySQL

Patches to support other databases are welcome! :-)

Supported Styles

Currently the following databases are supported:

Style	PostgreSQL	MySQL	Sqlite3	Description
args		Y		command-line arguments
filename			Y	filename
keyvalue	Y	Y		key-value pairs (legacy)
kwargs	Y			Python keyword arguments
pgpass	Y			`.pgpass` format
uri	Y	Y	Y	(See `dj-database-url`)

Exit Codes

Exit status is 0 unless invalid options were given.

Example Usage

```
# Prints the DSN for the default database
$ ./manage.py sqldsn
```

```
# Prints the DSN for all databases
$ ./manage.py sqldsn --all
```

```
# Print the DSN for database named 'slave'
$ ./manage.py sqldsn --database=slave
```

```
# Print all DSN styles available for the default database
$ ./manage.py sqldsn --style=all
```

```
# Print the URI for the default database
$ ./manage.py sqldsn -q --style=uri
```

```
# Create .pgpass file for default database by using the quiet option
$ ./manage.py sqldsn -q --style=pgpass > .pgpass
```

4.3.22 validate_templates

synopsis Checks templates on syntax or compile errors.

This will catch any invalid Django template syntax, for example:

```
{% foobar %}

{% comment %}
This throws this error:
TemplateSyntaxError Invalid block tag on line 1: 'foobar'. Did you forget to register␣
↪or load this tag?
{% endcomment %}
```

Note that this will not catch invalid HTML, only errors in the Django template syntax used.

Options

verbosity

A higher verbosity level will print out all the files that are processed instead of only the ones that contain errors.

break

Do not continue scanning other templates after the first failure.

ignore-app

Ignore this app (can be used multiple times).

includes

Use -i (can be used multiple times) to add directories to the TEMPLATE DIRS.

no-apps

Do not automatically include app template directories.

Settings

VALIDATE_TEMPLATES_IGNORE_APPS

Ignore the following apps

VALIDATE_TEMPLATES_IGNORES

Ignore file names which matches these patterns. Matching is done via *fnmatch*.

VALIDATE_TEMPLATES_EXTRA_TEMPLATE_DIRS

You can use *VALIDATE_TEMPLATES_EXTRA_TEMPLATE_DIRS* to include a number of template dirs by default directly from the settings file. This can be useful for situations where TEMPLATE DIRS is dynamically generated or switched in middleware, or when you have other template dirs for external applications like celery, and you want to check those as well.

Usage Example

```
./manage.py validate_templates
```

You can also integrate it with your tests, like this:

```
import unittest
from django.core.management import call_command

class MyTests(unittest.TestCase):
    def test_validate_templates(self):
        call_command("validate_templates")
        # This throws an error if it fails to validate
```

4.3.23 admin_generator

synopsis Generate automatic Django Admin classes by providing an app name. Outputs source code at STDOUT.

Generating automatically the admin for a given app

You have to provide the app_name you want the admin to be generated.

```
$ python manage.py admin_generator <your_app_name>
```

Example

Given the app name "brody", with the models:

```
from django.contrib.auth import get_user_model
from django.contrib.auth.models import User
from django.db import models
from django.utils.translation import gettext_lazy as _
from isbn_field import ISBNField


class Author(models.Model):
    first_name = models.CharField(max_length=30, verbose_name=_('First name'))
    last_name = models.CharField(max_length=40, verbose_name=_('Last name'))

    def __str__(self):
        return '{} {}'.format(self.first_name, self.last_name)

    class Meta:
```

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```
        verbose_name = _('Author')
        verbose_name_plural = _('Authors')


class Tag(models.Model):
    word = models.CharField(max_length=35, verbose_name=_('Word'))
    slug = models.CharField(max_length=50, verbose_name=_('Slug'))

    def __str__(self):
        return self.word

    class Meta:
        verbose_name = _('Tag')
        verbose_name_plural = _('Tags')


class Book(models.Model):
    title = models.CharField(max_length=40, verbose_name=_('Title'))
    cover = models.ImageField(upload_to='book-covers', verbose_name=_('Cover'),␣
↪blank=True)
    tags = models.ManyToManyField(Tag, verbose_name=_('Tags'), related_name='books')
    authors = models.ManyToManyField(Author, verbose_name=_('Authors'), related_name=
↪'books')
    publication_date = models.DateField(verbose_name=_('Publication date'))
    isbn = ISBNField(verbose_name=_('ISBN code'))

    def __str__(self):
        return self.title

    class Meta:
        verbose_name = _('Book')
        verbose_name_plural = _('Books')


class Borrow(models.Model):
    user = models.OneToOneField(get_user_model(), verbose_name=_('Usuario'), on_
↪delete=models.PROTECT)
    borrow_date = models.DateField(verbose_name=_('Borrow date'))
    returned_date = models.DateField(verbose_name=_('Returned date'), blank=True,␣
↪null=True)
    book = models.ForeignKey(Book, verbose_name=_('Book'), on_delete=models.PROTECT)

    class Meta:
        verbose_name = _('Borrow')
        verbose_name_plural = _('Borrows')

    def __str__(self):
        return '{}_{}'.format(self.user, self.borrow_date)
```

the following command:

```
$ python manage.py admin_generator brody
```

will output to STDOUT the following code:

```
# -*- coding: utf-8 -*-
from django.contrib import admin
```

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```
from .models import Author, Tag, Book, Borrow


@admin.register(Author)
class AuthorAdmin(admin.ModelAdmin):
    list_display = ('id', 'first_name', 'last_name')


@admin.register(Tag)
class TagAdmin(admin.ModelAdmin):
    list_display = ('id', 'word', 'slug')
    search_fields = ('slug',)


@admin.register(Book)
class BookAdmin(admin.ModelAdmin):
    list_display = ('id', 'title', 'cover', 'publication_date', 'isbn')
    list_filter = ('publication_date',)
    raw_id_fields = ('tags', 'authors')


@admin.register(Borrow)
class BorrowAdmin(admin.ModelAdmin):
    list_display = ('id', 'user', 'borrow_date', 'returned_date', 'book')
    list_filter = ('user', 'borrow_date', 'returned_date', 'book')
```

- *shell_plus* - An enhanced version of the Django shell. It will autoload all your models making it easy to work with the ORM right away.
- *admin_generator* - Generate automatic Django Admin classes by providing an app name. Outputs source code at STDOUT.
- *clean_pyc* - Remove all python bytecode compiled files from the project
- *create_command* - Creates a command extension directory structure within the specified application. This makes it easy to get started with adding a command extension to your application.
- *create_template_tags* - Creates a template tag directory structure within the specified application.
- *create_jobs* - Creates a Django jobs command directory structure for the given app name in the current directory. This is part of the impressive jobs system.
- *clear_cache* - Clear django cache, useful when testing or deploying.
- *compile_pyc* - Compile python bytecode files for the project.
- *describe_form* - Used to display a form definition for a model. Copy and paste the contents into your forms.py and you're ready to go.
- *delete_squashed_migrations* - Deletes leftover migrations after squashing and converts squashed migration to a normal one.
- *dumpscript* - Generates a Python script that will repopulate the database using objects. The advantage of this approach is that it is easy to understand, and more flexible than directly populating the database, or using XML.
- export_emails - export the email addresses for your users in one of many formats. Currently supports Address, Google, Outlook, LinkedIn, and VCard formats.
- *find_template* - Finds the location of the given template by resolving its path
- *generate_secret_key* - Creates a new secret key that you can put in your settings.py module.

- graph_models - Creates a GraphViz dot file. You need to send this output to a file yourself. Great for graphing your models. Pass multiple application names to combine all the models into a single dot file.
- list_model_info - Lists out all the fields and methods for models in installed apps. This is helpful when you don't remember how to refer to a related field or want to quickly identify the fields and methods available in a particular model.
- *mail_debug* - Starts a mail server which echos out the contents of the email instead of sending it.
- *merge_model_instances* - Merges duplicate model instances by reassigning related model references to a chosen primary model instance.
- *notes* - Show all annotations like TODO, FIXME, BUG, HACK, WARNING, NOTE or XXX in your py and HTML files.
- *passwd* - DEPRECATED: Use Django's `changepassword`.
- *pipchecker* - Scan pip requirement file(s)s for out-of-date packages. Similar to `pip list -o` which used installed packages (in virtualenv) instead of requirements file(s).
- print_settings - Similar to `diffsettings` but shows *selected* active Django settings or *all* if no args passed.
- *print_user_for_session* - Print the user information for the provided session key. this is very helpful when trying to track down the person who experienced a site crash. It seems this works only if setting `SESSION_ENGINE` is `'django.contrib.sessions.backends.db'` (default value).
- *drop_test_database* - Drops the test database. Usefull when running Django test via some automated system (BuildBot, Jenkins, etc) and making sure that the test database is always dropped at the end.
- *raise_test_exception* - Raises a test exception via command. Useful for debugging error reporters such as Sentry.
- *reset_db* - Resets a database (currently sqlite3, mysql, postgres). Uses "DROP DATABASE" and "CREATE DATABASE".
- *runjob* - Run a single maintenance job. Part of the jobs system.
- *runjobs* - Runs scheduled maintenance jobs. Specify hourly, daily, weekly, monthly. Part of the jobs system.
- *runprofileserver* - Starts *runserver* with hotshot/profiling tools enabled. I haven't had a chance to check this one out, but it looks really cool.
- runscript - Runs a script in the django context.
- runserver_plus - The standard runserver stuff but with the Werkzeug debugger baked in. Requires Werkzeug. This one kicks ass.
- *set_fake_emails* - Give all users a new email based on their account data ("%(username)s@example.com" by default). Possible parameters are: username, first_name, last_name. *DEBUG only*
- *set_fake_passwords* - Sets all user passwords to a common value (*password* by default). *DEBUG only*.
- *show_template_tags* - Displays template tags and filters available in the current project.
- *show_urls* - Displays the url routes that are defined in your project. Very crude at this point.
- *sqldiff* - Prints the (approximated) difference between an app's models and what is in the database. This is very nice, but also very experimental at the moment. It can not catch everything but it's a great sanity check.
- *sqlcreate* - Generates the SQL to create your database for you, as specified in settings.py.
- *sqldsn* - Reads the Django settings and extracts the parameters needed to connect to databases using other programs.
- sync_s3 - Copies files found in settings.MEDIA_ROOT to S3. Optionally can also gzip CSS and Javascript files and set the Content-Encoding header, and also set a far future expires header for browser caching.

- *syncdata* - Makes the current database have the same data as the fixture(s), no more, no less.
- *unreferenced_files* - Prints a list of all files in MEDIA_ROOT that are not referenced in the database.
- *update_permissions* - Reloads permissions for specified apps, or all apps if no args are specified.
- *validate_templates* - Validate templates on syntax and compile errors.
- *set_default_site* - Set parameters of the default *django.contrib.sites* Site using *name* and *domain* or *system-fqdn*.

4.4 Command Signals

synopsis Signals fired before and after a command is executed.

A signal is thrown pre/post each management command allowing your application to hook into each commands execution.

4.4.1 Basic Example

An example hooking into show_template_tags:

```
from django_extensions.management.signals import pre_command, post_command
from django_extensions.management.commands.show_template_tags import Command

def pre_receiver(sender, args, kwargs):
  # I'm executed prior to the management command

def post_receiver(sender, args, kwargs, outcome):
  # I'm executed after the management command

pre_command.connect(pre_receiver, Command)
post_command.connect(post_receiver, Command)
```

4.4.2 Custom Permissions For All Models

You can use the post signal to hook into the `update_permissions` command so that you can add your own permissions to each model.

For instance, lets say you want to add `list` and `view` permissions to each model. You could do this by adding them to the `permissions` tuple inside your models `Meta` class but this gets pretty tedious.

An easier solution is to hook into the `update_permissions` call, as follows;

```
from django.db.models.signals import post_syncdb
from django.contrib.contenttypes.models import ContentType
from django.contrib.auth.models import Permission
from django_extensions.management.signals import post_command
from django_extensions.management.commands.update_permissions import Command as␣
↪UpdatePermissionsCommand

def add_permissions(sender, **kwargs):
  """
  Add view and list permissions to all content types.
  """
  # for each of our content types
```

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```
  for content_type in ContentType.objects.all():

    for action in ['view', 'list']:
      # build our permission slug
      codename = "%s_%s" % (action, content_type.model)

      try:
        Permission.objects.get(content_type=content_type, codename=codename)
        # Already exists, ignore
      except Permission.DoesNotExist:
        # Doesn't exist, add it
        Permission.objects.create(content_type=content_type,
                    codename=codename,
                    name="Can %s %s" % (action, content_type.name))
        print "Added %s permission for %s" % (action, content_type.name)
post_command.connect(add_permissions, UpdatePermissionsCommand)
```

Each time `update_permissions` is called `add_permissions` will be called which ensures there are view and list permissions to all content types.

4.4.3 Using pre/post signals on your own commands

The signals are implemented using a decorator on the handle method of a management command, thus using this functionality in your own application is trivial:

```
from django_extensions.management.utils import signalcommand

class Command(BaseCommand):

  @signalcommand
  def handle(self, *args, **kwargs):
    ...
    ...
```

4.5 Debugger Tags

synopsis Allows you to use debugger breakpoints on Django templates.

4.5.1 Introduction

These templatetags make debugging Django templates easier. You can choose between ipdb, pdb or wdb filters.

4.5.2 Usage

Make sure that you load *debugger_tags*:

```
{% load debugger_tags %}
```

Now, you're ready to use debugger filters inside a template:

```
{% for object in object_list %}
    {{ object|ipdb }}
{% endfor %}
```

When rendering the template an ipdb session will be started.

4.6 Field Extensions

synopsis Field Extensions

4.6.1 Current Database Model Field Extensions

- *AutoSlugField* - AutoSlugField will automatically create a unique slug incrementing an appended number on the slug until it is unique. Inspired by SmileyChris' Unique Slugify snippet.

  AutoSlugField takes a *populate_from* argument that specifies which field, list of fields, or model method the slug will be populated from, for instance:

  ```
  slug = AutoSlugField(populate_from=['title', 'description', 'get_author_name'])
  ```

  populate_from can traverse a ForeignKey relationship by using Django ORM syntax:

  ```
  slug = AutoSlugField(populate_from=['related_model__title', 'related_model__get_
  ↪readable_name'])
  ```

  AutoSlugField uses Django's slugify function by default to "slugify" `populate_from` field.

  To provide custom "slugify" function you could either provide the function as an argument to `AutoSlugField` or define your `slugify_function` method within a model.

1. `slugify_function` as an argument to `AutoSlugField`.

   ```
   # models.py

   from django.db import models

   from django_extensions.db.fields import AutoSlugField


   def my_slugify_function(content):
       return content.replace('_', '-').lower()


   class MyModel(models.Model):

       title = models.CharField(max_length=42)
       slug = AutoSlugField(populate_from='title', slugify_function=my_slugify_
   ↪function)
   ```

2. `slugify_function` as a method within a model class.

   ```
   # models.py

   from django.db import models
   ```

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```
from django_extensions.db.fields import AutoSlugField


class MyModel(models.Model):

    title = models.CharField(max_length=42)
    slug = AutoSlugField(populate_from='title')

    def slugify_function(self, content):
        return content.replace('_', '-').lower()
```

Important. If you both provide `slugify_function` in a model class and pass `slugify_function` to `AutoSlugField` field, then model's `slugify_function` method will take precedence.

- *RandomCharField* - AutoRandomCharField will automatically create a unique random character field with the specified length. By default upper/lower case and digits are included as possible characters. Given a length of 8 that yields 3.4 million possible combinations. A 12 character field would yield about 2 billion. Below are some examples:

```
>>> RandomCharField(length=8, unique=True)
BVm9GEaE

>>> RandomCharField(length=4, include_alpha=False)
7097

>>> RandomCharField(length=12, include_punctuation=True)
k[ZS.TR,0LHO

>>> RandomCharField(length=12, lowercase=True, include_digits=False)
pzolbemetmok
```

- *CreationDateTimeField* - DateTimeField that will automatically set its date when the object is first saved to the database. Works in the same way as the auto_now_add keyword.
- *ModificationDateTimeField* - DateTimeField that will automatically set its date when an object is saved to the database. Works in the same way as the auto_now keyword. It is possible to preserve the current timestamp by setting update_modified to False:

```
>>> example = MyTimeStampedModel.objects.get(pk=1)

>>> print example.modified
datetime.datetime(2016, 3, 18, 10, 3, 39, 740349, tzinfo=<UTC>)

>>> example.save(update_modified=False)

>>> print example.modified
datetime.datetime(2016, 3, 18, 10, 3, 39, 740349, tzinfo=<UTC>)

>>> example.save()

>>> print example.modified
datetime.datetime(2016, 4, 8, 14, 25, 43, 123456, tzinfo=<UTC>)
```

It is also possible to set the attribute directly on the model, for example when you don't use the TimeStampedModel provided in this package, or when you are in a migration:

```
>>> example = MyCustomModel.objects.get(pk=1)

>>> print example.modified
datetime.datetime(2016, 3, 18, 10, 3, 39, 740349, tzinfo=<UTC>)

>>> example.update_modified=False

>>> example.save()

>>> print example.modified
datetime.datetime(2016, 3, 18, 10, 3, 39, 740349, tzinfo=<UTC>)
```

- *ShortUUIDField* - CharField which transparently generates a UUID and pass it to base57. It result in shorter 22 characters values useful e.g. for concise, unambiguous URLS. It's possible to get shorter values with length parameter: they are not Universal Unique any more but probability of collision is still low
- *JSONField* - a generic TextField that neatly serializes/unserializes JSON objects seamlessly. Django 1.9 introduces a native JSONField for PostgreSQL, which is preferred for PostgreSQL users on Django 1.9 and above.

4.7 Jobs Scheduling

synopsis Documentation on creating/using jobs in Django-extensions

Creating jobs works much like management commands work in Django.

4.7.1 Setup

Run

```
$ python manage.py create_jobs <django_application>
```

to make a `jobs` directory inside of an application. The `jobs` directory will have the following tree:

```
jobs
├── daily
│   └── __init__.py
├── hourly
│   └── __init__.py
├── monthly
│   └── __init__.py
├── weekly
│   └── __init__.py
├── yearly
│   └── __init__.py
├── __init__.py
└── sample.py
```

4.7.2 Create a job

A job is a Python script with a mandatory `BaseJob` class which extends from `MinutelyJob`, `QuarterHourlyJob`, `HourlyJob`, `DailyJob`, `WeeklyJob`, `MonthlyJob` or `Yearly`. It has one method that must be implemented called `execute`, which is called when the job is run. The directories `hourly`, `daily`, `monthly`, `weekly` and `yearly` are used only to for organisation purpose.

Note: If you want to use `QuarterHourlyJob` or `Minutely` job, create python package with name `quarter_hourly` or `minutely` respectively (similar to `hourly` or `daily` package).

To create your first job you can start copying `sample.py`. Remember to replace `BaseJob` with `MinutelyJob`, `QuarterHourlyJob`, `HourlyJob`, `DailyJob`, `WeeklyJob`, `MonthlyJob` or `Yearly`. Some simple examples are provided by the django_extensions.jobs package.

Note that each job should be in a new python script (within respective directory) and the class implementing the cron should be named `Job`. Also, `__init__.py` file is not used for identifying jobs.

4.7.3 Run a job

The following commands are related to jobs:

- `create_jobs`, create the directory structure for jobs
- `runjob`, run a single job
- `runjobs`, run all hourly/daily/weekly/monthly jobs

Use "runjob(s) -l" to list all jobs recognized.

Jobs do not run automatically! You must either run a job manually specifying the exact time on which the command is to be run, or use crontab:

```
@hourly /path/to/my/project/manage.py runjobs hourly
```

```
@daily /path/to/my/project/manage.py runjobs daily
```

```
@weekly /path/to/my/project/manage.py runjobs weekly
```

```
@monthly /path/to/my/project/manage.py runjobs monthly
```

4.8 Model Extensions

synopsis Model Extensions

4.8.1 Introduction

Django Extensions provides you a set of Abstract Base Classes for models that implements commonly used patterns like holding the model's creation and last modification dates.

4.8.2 Database Model Extensions

- *ActivatorModel* - Abstract Base Class that provides a `status`, `activate_date`, and `deactivate_date` fields.

The `status` field is an `IntegerField` whose value is chosen from a tuple of choices - active and inactive - defaulting to active. This model also exposes a custom manager, allowing the user to easily query for active or inactive objects.

E.g.: `Model.objects.active()` returns all instances of `Model` that have an active status.

- *TitleDescriptionModel* - This Abstract Base Class model provides `title` and `description` fields.

The `title` field is `CharField` with a maximum length of 255 characters, non-nullable. `description`. On the other hand, `description` is a nullable `TextField`.

- *TimeStampedModel* - An Abstract Base Class model that provides self-managed `created` and `modified` fields.

Both of the fields are customly defined in Django Extensions as `CreationDateTimeField` and `ModificationDateTimeField`. Those fields are subclasses of Django's `DateTimeField` and will store the value of `django.utils.timezone.now()` on the model's creation and modification, respectively

- *TitleSlugDescriptionModel* - An Abstract Base Class model that, like the `TitleDescriptionModel`, provides `title` and `description` fields but also provides a self-managed `slug` field which populates from the title.

That field's class is a custom defined AutoSlugField, based on Django's `SlugField`. By default, it uses – as a separator, is unique and does not accept blank values. It is possible to customize `slugify_function` by defining your custom function within a model:

```
# models.py

from django.db import models

from django_extensions.db.models import TitleSlugDescriptionModel


class MyModel(TitleSlugDescriptionModel, models.Model):

    def slugify_function(self, content):
        """
        This function will be used to slugify
        the title (default `populate_from` field)
        """
        return content.replace('_', '-').lower()
```

See AutoSlugField docs for more details.

4.9 Permissions

synopsis Permissions Mixins to limit access and model instances in a view.

4.9.1 Introduction

Django Extensions offers mixins for Class Based Views that make it easier to query and limit access to certain views.

4.9.2 Current Mixins

- *ModelUserFieldPermissionMixin* - A Class Based View mixin that limits the accessibility to the view based on the "owner" of the view.

This will check if the currently logged in user (`self.request.user`) matches the owner of the model instance. By default, the "owner" will be called "user".

```
# models.py

from django.db import models
from django.conf import settings

class MyModel(models.Model):
   author = models.ForeignKey(settings.AUTH_USER_MODEL, on_delete = models.CASCADE)
   content = models.TextField()
```

```
# views.py

from django.views.generic import UpdateView

from django_extensions.auth.mixins import ModelUserFieldPermissionMixin

from .models import MyModel

class MyModelUpdateView(ModelUserFieldPermissionMixin, UpdateView):
   model = MyModel
   template_name = 'mymodels/update.html'
   model_permission_user_field = 'author'
```

4.10 Utilities

synopsis Other utility functions or classes

4.10.1 InternalIPS

InternalIPS allows to specify CIDRs for *INTERNAL_IPS* settings parameter.

Example *settings.py*:

```
from django_extensions.utils import InternalIPS

INTERNAL_IPS = InternalIPS([
    "127.0.0.1",
    "172.16.0.0/16",
])
```

Use *sort_by_size* to sort the lookups to search the largest subnet first.

Example *settings.py*:

```
from django_extensions.utils.internal_ips import InternalIPS

INTERNAL_IPS = InternalIPS([
    "127.0.0.1",
    "172.16.0.0/16",
], sort_by_size=True)
```

InternalIPS is inspired by *netaddr.IPSet* please consider using it instead as it is more optimized but requires the additional *netaddr* package.

4.11 Validators

synopsis Validator extensions

4.11.1 Usage

Example:

```
from django_extensions.validators import HexValidator

class UserKeys(models.Model):
    user = models.OneToOneField(settings.AUTH_USER_MODEL, on_delete=models.CASCADE)

    public_key = models.CharField(max_length=64, validators=[HexValidator(length=64)])
    private_key = models.CharField(max_length=128,␣
↪validators=[HexValidator(length=128)])
```

4.11.2 Current Database Model Field Extensions

NoControlCharactersValidator

Validates that Control Characters like new lines or tabs are not allowed. Can optionally specify *whitelist* of control characters to allow.

NoWhitespaceValidator

Validates that leading and trailing whitespace is not allowed.

HexValidator

Validates that the string is a valid hex string. Can optionally also specify *length*, *min_length* and *max_length* parameters.

CHAPTER 5

Indices and tables

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