A (fast-paced) introduction

Jacob Kaplan-Moss

Colorado Software Summit

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http://bit.ly/css2008-django-tutorial

What's on the plate

What's on the plate

- ➜ A (quick) introduction

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- A (quick) introduction
- Creating models

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- The automatic admin interface

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- Views (and URLs)
- Templates

Introduction

“Django is a high-level Python web framework that encourages rapid development and clean, pragmatic design.”

“Django is a high-level Python web framework…”

“…that encourages rapid development…”

“...and clean, pragmatic design.”

More...

http://docs.djangoproject.com/en/dev/misc/design-philosophies/

http://www.djangobook.com/en/1.0/chapter01/

Installation

http://docs.djangoproject.com/en/dev/intro/install/

http://www.djangobook.com/en/1.0/chapter02/

http://code.djangoproject.com/wiki/SetupOnTiger

http://code.djangoproject.com/wiki/WindowsInstall

“Projects”

Our project:

cheeserater

By Name By Category By Score Search

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docutils

Docutils -- Python Documentation Utilities

Docutils is a modular system for processing documentation into useful formats, such as HTML, XML, and LaTeX. For input Docutils supports reStructuredText, an easy-to-read, what-you-see-is-what-you-get plaintext markup syntax.

+5

Moldy Fresh

Author:
David Goodger

Links:
Home page
Cheeseshop page

Categories:
Development Status :: 3 - Alpha
Environment :: Console
Intended Audience :: Developers
Intended Audience :: End Users/Desktop
Intended Audience :: Other Audience
Intended Audience :: System Administrators
License :: OSI Approved :: BSD License
License :: OSI Approved :: GNU General Public License (GPL)
License :: OSI Approved :: Python Software Foundation License
License :: Public Domain
Natural Language :: Afrikaans
Natural Language :: English
Natural Language :: Esperanto
Natural Language :: French
Natural Language :: German
Natural Language :: Italian
Natural Language :: Russian
Natural Language :: Slovak
Natural Language :: Spanish
Natural Language :: Swedish
Operating System :: OS Independent
Programming Language :: Python
Topic :: Documentation
Topic :: Software Development :: Documentation
Topic :: Text Processing

cheeserater

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Programming Language :: Python
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http://www.cheeserater.com/

cheeserater

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http://www.cheeserater.com/

http://github.com/jacobian/cheeserater/tree

```
$ django-admin.py startproject cheeserater
```

```
cheeserater/
    __init__.py
    manage.py
    settings.py
    urls.py
```

```
$ ./manage.py runserver
Validating models...
0 errors found.

Django version 1.0, using settings
'cheeserater.settings'
Development server is running at
http://127.0.0.1:8000/
Quit the server with CONTROL-C.
```

It worked!

Congratulations on your first Django-powered page.

Of course, you haven't actually done any work yet. Here's what to do next:

- If you plan to use a database, edit the `DATABASE_*` settings in `cheeserater/settings.py`.
- Start your first app by running `python cheeserater/manage.py startapp [appname]`.

You're seeing this message because you have `DEBUG = True` in your Django settings file and you haven't configured any URLs. Get to work!

Project settings

- DATABASE_ENGINE
- DATABASE_NAME
- DATABASE_USER
- DATABASE_PASSWORD
- DATABASE_HOST

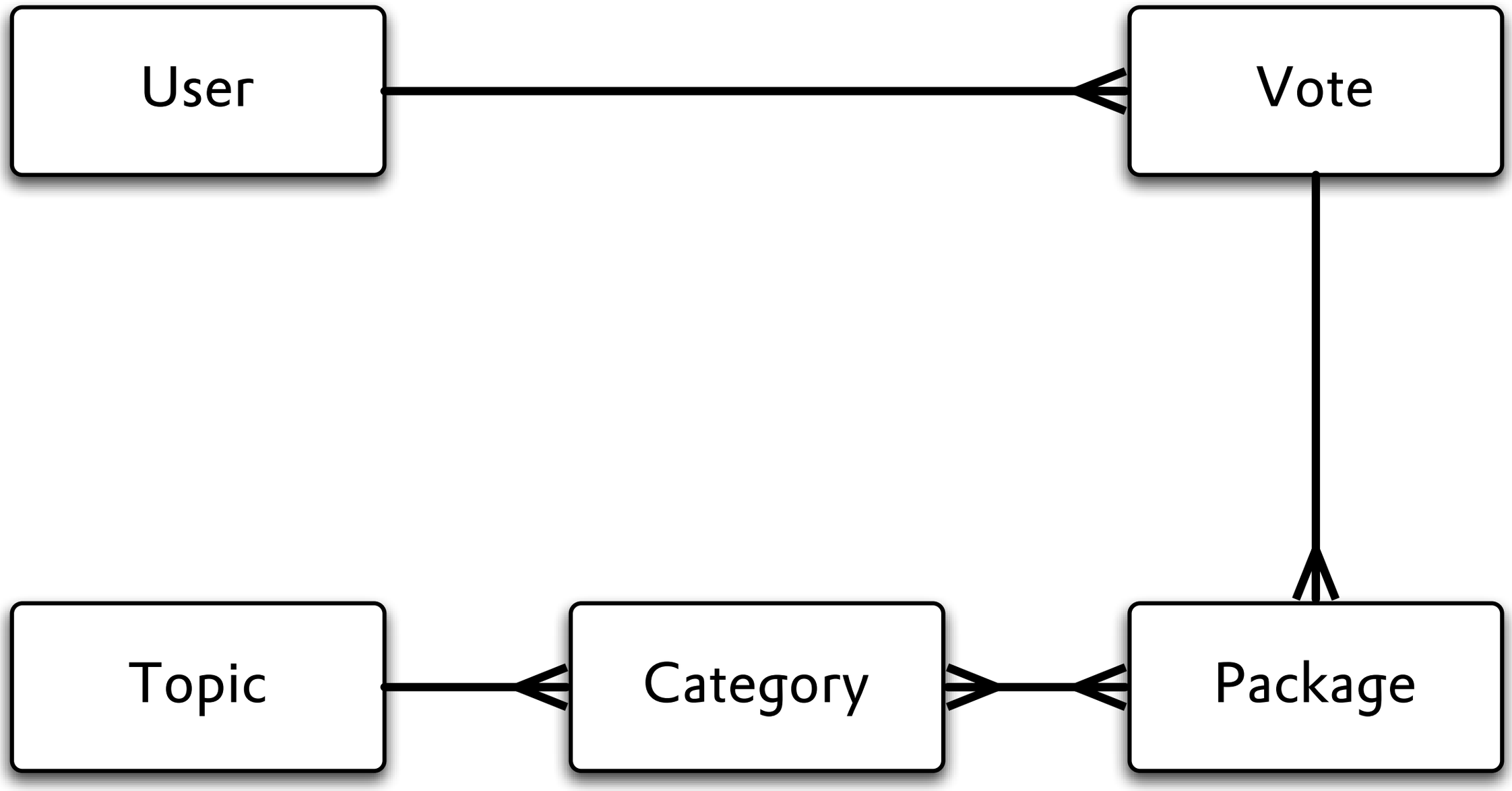
```
$ ./manage.py syncdb
Creating table auth_message
Creating table auth_group
…
You just installed Django's auth system,
which means you don't have any superusers defined.
Would you like to create one now? (yes/no): yes
Username (Leave blank to use 'jacob'): jacob
E-mail address: jacob@jacobian.org
Password:
Password (again):
Superuser created successfully.
…
Adding permission 'user | Can add user'
Adding permission 'user | Can change user'
Adding permission 'user | Can delete user'
…
```

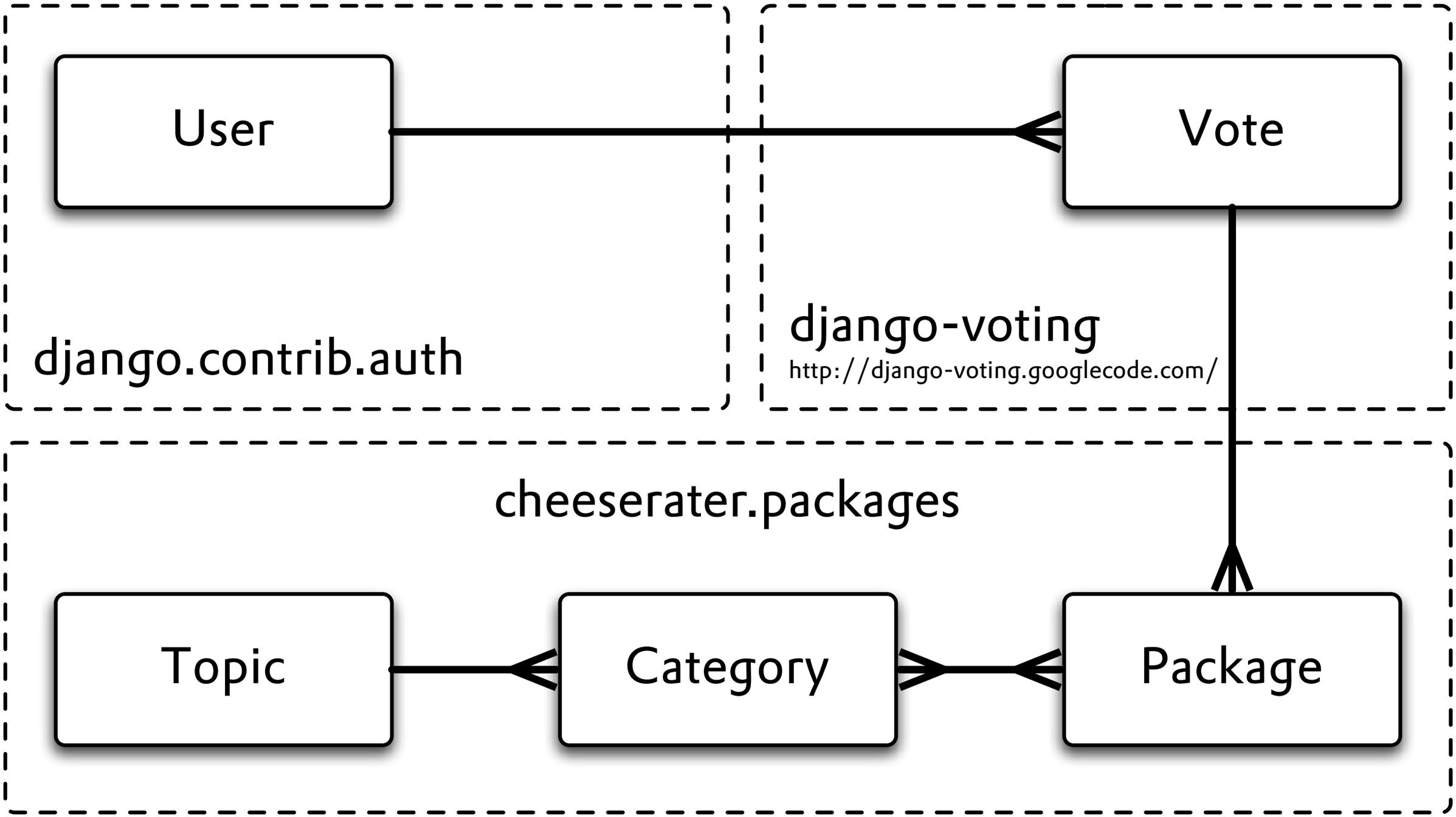
More...

http://docs.djangoproject.com/en/dev/topics/settings/

http://docs.djangoproject.com/en/dev/ref/django-admin/

“Apps”





Models

What's a model?

```
CREATE TABLE "packages_package" (
    "id" integer NOT NULL PRIMARY KEY,
    "name" varchar(300) NOT NULL,
    "version" varchar(300) NOT NULL,
    "home_page" varchar(200) NOT NULL,
    "summary" text NOT NULL,
    "description" text NOT NULL,
    "keywords" text NOT NULL
);
```

Scary Quirky Language

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- SQL is tough

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- SQL knows no version control

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- DRY

Scary Quirky Language

- SQL is tough
- SQL knows no version control
- DRY
- Python is fun!

Defining Models

```
$ ./manage.py startapp packages
```

```
INSTALLED_APPS = (
    "django.contrib.auth",
    "django.contrib.contenttypes",
    "django.contrib.sessions",
    "django.contrib.sites",
    "cheeserater.packages"
)
```

```
from django.db import models

class Package(models.Model):
    name         = models.CharField(max_length=300)
    version      = models.CharField(max_length=300,
                                    blank=True)
    author       = models.CharField(max_length=300,
                                    blank=True)
    home_page    = models.URLField(blank=True)
    summary      = models.TextField()
    description = models.TextField(blank=True)
    keywords     = models.TextField(blank=True)
    categories   = models.ManyToManyField(Category,
                                  related_name="packages")
```

```
$ ./manage.py validate
0 errors found.
```

```
$ ./manage.py syncdb
Creating table packages_package
...
```

Model API

```
$ ./manage.py shell
```

```
>>> from cheeserater.packages.models import Package
>>> p = Package(
...     name="Django",
...     version="1.0")
>>> p.save()
```

```
>>> ps = Package.objects.all()
>>> ps
[<Package: Package object>]

>>> ps[0].name
u'Django'

>>> p = Package.objects.get(name__contains="Dj")
>>> p.version
u'1.0'
```

Model metadata

```
class Package(models.Model):
    …
```

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

```
class Package(models.Model):
    …

    class Meta:
        ordering = ["name"]
        verbose_name = "cheeseshop package"
        verbose_name_plural = "cheeseshop packages"
```

Relationships

```
class Topic(models.Model):
    name = models.CharField(max_length=150, unique=True)
    slug = models.SlugField()
```

```
class Category(models.Model):
    topic = models.ForeignKey(Package,
                              related_name="categories")
    value = models.CharField(max_length=100)
    slug = models.SlugField()
```

```
>>> license = Topic.objects.get(name="License")
>>> license.categories.all()
[<Category: License :: DFSG approved>, ...]
>>> license.categories.filter(value__startswith="OSI").count()
17L

>>> bsd = license.categories.get(value__contains="BSD")
>>> bsd.topic
<Topic: License>
>>> bsd.packages.count()
210L
```

```
>>> p = Package.objects.get(name="BeautifulSoup")
>>> p.categories.all()
[<Category: Programming Language :: Python>, ...]
>>> p.categories.get(topic=license)
<Category: License :: OSI Approved :: Python Software Foundation License>

>>> p.categories = [bsd]
>>> p.categories.all()
[<Category: License :: OSI Approved :: BSD License>]
```

Show all Spanish-language packages with a BSD license.

```
>>> packages = Package.objects.filter(
...     categories__topic__name = "Natural Language",
...     categories__value__contains = "Spanish"
...     categories__topic__name = "License",
...     categories__value__contains = "BSD"
... )
>>> packages
[<Package: TaskCoach>, ...]
```

```
>>> packages = Package.objects.filter(
...     categories__topic__name = "Natural Language"
...     categories__value__contains = "Spanish"
... )
>>> packages = packages.filter(
...     categories__topic__name = "License",
...     categories__value__contains = "BSD"
... )
>>> packages
[<Package: TaskCoach>, ...]
```

More...

http://docs.djangoproject.com/en/dev/topics/db/models/

http://docs.djangoproject.com/en/dev/topics/db/queries/

Django Admin

What is it?

Activate!

```
from django.contrib import admin
from cheeserater.packages.models import Package

admin.site.register(Package)
```

```
from django.contrib import admin
from cheeserater.packages.models import Package

class PackageAdmin(admin.ModelAdmin):
    list_display = ('name', 'version', 'summary')
    search_fields = ('name', 'summary', 'keywords')

admin.site.register(Package, PackageAdmin)
```

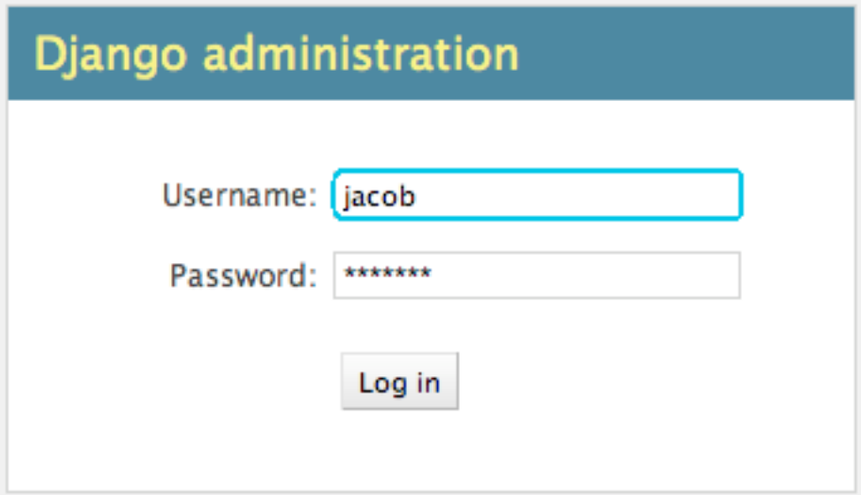
```
INSTALLED_APPS = (
    "django.contrib.auth",
    "django.contrib.contenttypes",
    "django.contrib.sessions",
    "django.contrib.sites",
    "django.contrib.admin",
    "cheeserater.packages",
)
```

```
from django.conf.urls.defaults import *
from django.contrib import admin

admin.autodiscover()

urlpatterns = patterns('',
  (r'^admin/(.*)', admin.site.root,
)
```

```
$ ./manage.py runserver
```



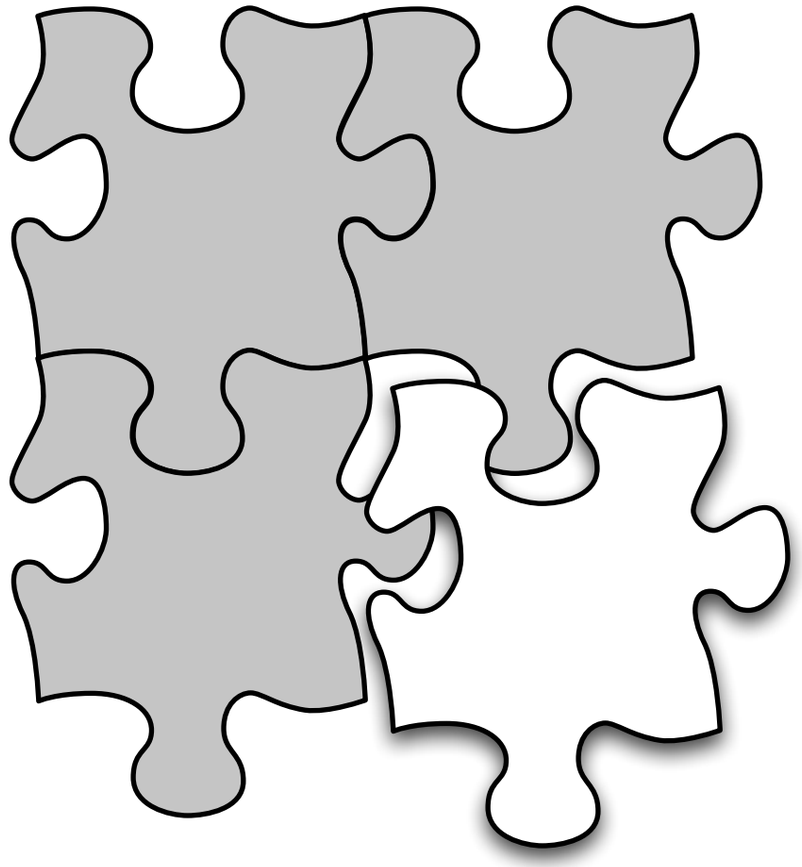
More...

http://docs.djangoproject.com/en/dev/intro/tutorial02/

http://docs.djangoproject.com/en/dev/ref/contrib/admin/

Views

What's a view?



URLs

page.php

script.cgi?pageid=144

StoryPage.aspx

0,2097,1-1-30-72-40

7-4752,00.html

/packages/

/packages/Unipath/

/packages/reportlab/

```
ROOT_URLCONF = "cheeserater.urls"
```

```
from django.conf.urls.defaults import *
from django.contrib import admin
from cheeserater.packages.views import *

urlpatterns = patterns('',
    (r'^admin/(.*)', admin.site.root),
    ('^packages/$', package_list),
    ('^packages/(?P<package_name>.*)/$', package_detail),
)

admin.autodiscover()
```

Dissecting a request

➜ `GET /packages/Unipath/`

➜ `ROOT_URLCONF`

➜ `cheeserater.urls`

➜
```
('^packages/(?P<package_name>.*)/$',
 package_detail)
```

➜
```
package_detail(request,
               package_name='Unipath')
```

More...

http://docs.djangoproject.com/en/dev/topics/http/urls/

A first view

```
from django.http import HttpResponse

def package_list(request):
    return HttpResponse("This is the package list!")
```

```
from django.http import HttpResponse
from cheeserater.packages.models import Package

def package_list(request):
    r = "<ul>"
    ps = Package.objects.order_by("name")
    for p in ps:
        r += "<li>%s: %s</li>" % \
                        (p.name, p.description)
    r += "</ul>"
    return HttpResponse(r)
```

```
from django import template
from django.http import HttpResponse
from cheeserater.packages.models import Package

def package_list(request):
    ps = Package.objects.order_by("name")
    t = template.loader.get_template("packages/index.html")
    c = Context({"package_list": ps})
    return HttpResponse(t.render(c))
```

```
from django.shortcuts import render_to_response
from cheeserater.packages.models import Package

def package_index(request):
    ps = Package.objects.order_by("name")
    return render_to_response(
        "packages/index.html",
        {"package_list" : ps}
    )
```

Templates

What's a template?

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN">
<html lang="en">
<head><title>Packages</title></head>
<body>
  <h1>Packages ({{ package_list|length }} total)</h1>
  <ul>
    {% for p in package_list %}
      <li>
        <a href="{{ p.name|urlencode }}/">
          {{ p.name }}
        </a>
      </li>
    {% endfor %}
  </ul>
</body>
</html>
```

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN">
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<head><title>Packages</title></head>
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  <h1>Packages ({{ package_list|length }} total)</h1>
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      <li>
        <a href="{{ p.name|urlencode }}/">
          {{ p.name }}
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      </li>
    {% endfor %}
  </ul>
</body>
</html>
```

The magic dot

➜ `p["name"]`

➜ `p.name`

➜ `p.name()`

```
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<head><title>Packages</title></head>
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  <h1>Packages ({{ package_list|length }} total)</h1>
  <ul>
    {% for p in package_list %}
      <li>
        <a href="{{ p.name|urlencode }}/">
          {{ p.name }}
        </a>
      </li>
    {% endfor %}
  </ul>
</body>
</html>
```

```
{{ text|escape|linkbreaks }}
```

```
{{ text|truncatewords:"30" }}
```

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN">
<html lang="en">
<head><title>Packages</title></head>
<body>
  <h1>Packages ({{ package_list|length }} total)</h1>
  <ul>
    {% for p in package_list %}
      <li>
        <a href="{{ p.name|urlencode }}/">
          {{ p.name }}
        </a>
      </li>
    {% endfor %}
  </ul>
</body>
</html>
```

Template inheritance

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN">
<html lang="en">
<head>
  <title>
    {% block title %}CheeseRater{% endblock %}
  </title>
</head>
<body>
  <div id="content">
    {% block content %}{% endblock %}
  </div>
  <div id="footer">
    {% block footer %}Copyright blah..{% endblock %}
  </div>
</body>
</html>
```

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN">
<html lang="en">
<head>
  <title>
    {% block title %}CheeseRater{% endblock %}
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    {% block content %}{% endblock %}
  </div>
  <div id="footer">
    {% block footer %}Copyright blah..{% endblock %}
  </div>
</body>
</html>
```
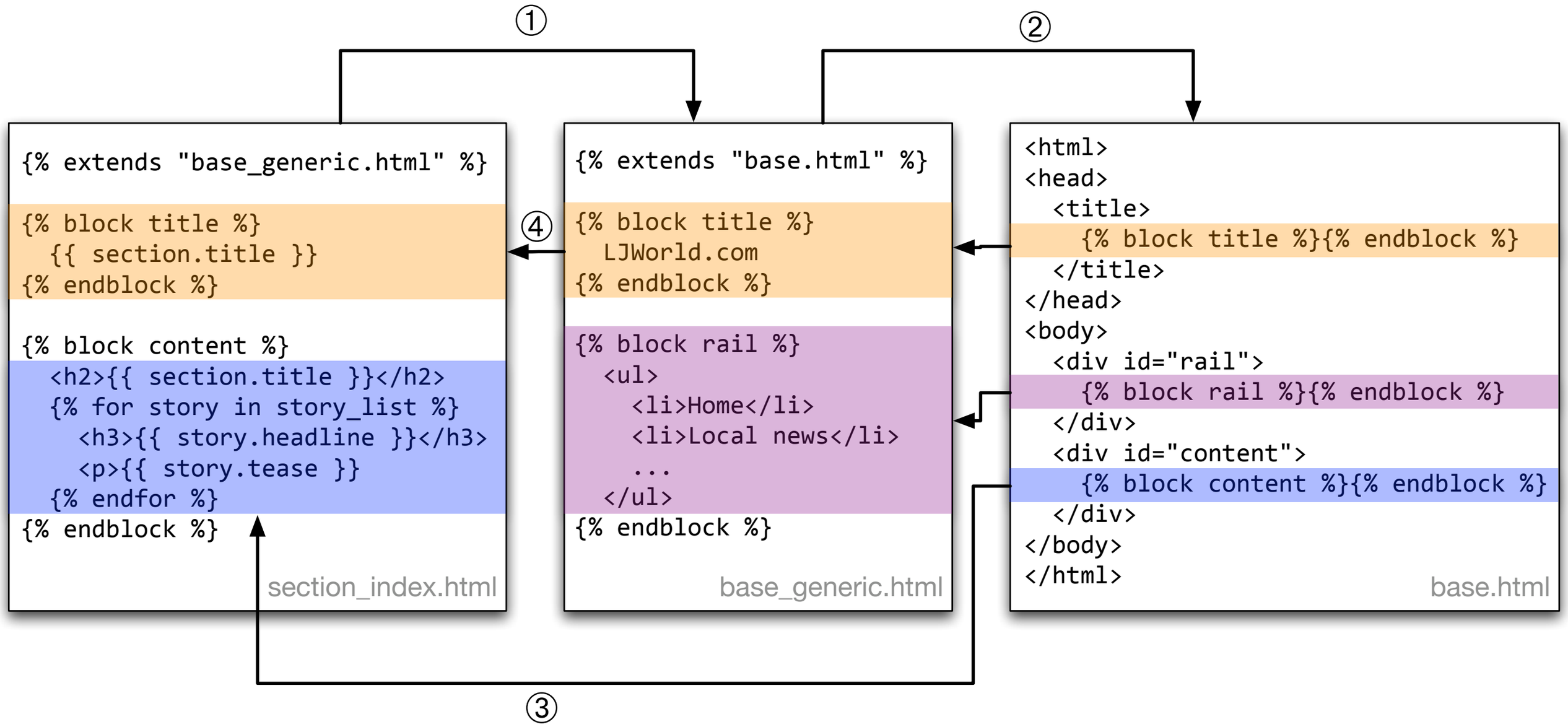

```
{% extends "base.html" %}

{% block title %}
  Packages | {{ block.super }}
{% endblock %}

{% block content %}
  <h1>Packages ({{ package_list|length }} total)</h1>
  <ul>
    {% for p in package_list %}
      <li>
        <a href="{{ p.name|urlencode }}/">
          {{ p.name }}
        </a>
      </li>
    {% endfor %}
  </ul>
{% endblock %}
```



Why?

Inheritance tips

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- If you're duplicating content, you're missing a block.
- {{ block.super }}

More...

http://docs.djangoproject.com/en/dev/topics/templates/

What else ya'got?

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➜ Generic views

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- Testing tools

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- Support for legacy databases

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- Support for legacy databases
- Automatic CSRF protection

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- Sitemaps
- Support for legacy databases
- Automatic CSRF protection
- GIS
- Pluggable file storage

Get involved!

http://www.djangoproject.com/

http://groups.google.com/group/django-users

jacob@jacobian.org