

La D è muta: introduzione a Django

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Consultant

Free software developer

- maintainer: django-admin-bootstrapped, uwsgitop
- contributor: uwsgi, LibreOffice

Python

Highlights

- OO but functional friendly
- whitespace indentation
- late binding type system, strong types
- great standard library
- implementations: cpython 2 and 3, pypy, jython
- package manager: pip, <https://pypi.python.org>

```
>>> import this
```

The Zen of Python, by Tim Peters

Beautiful is better than ugly.

Explicit is better than implicit.

Simple is better than complex.

Complex is better than complicated.

Readability counts.

[...]

Quiz

```
>>> langs = [  
    csharp,  
    java,  
    javascript,  
    php,  
    python,  
    ruby  
]  
>>> langs = sorted(langs,  
                    key=lambda l: l.year)
```

Answer

```
>>> [(l.name, l.year) for l in langs]
[
    ('python', 1991),
    ('java', 1995),
    ('javascript', 1995)
    ('php', 1995),
    ('ruby', 1995),
    ('csharp', 2000)
]
```

Django

Facts

- Born in 2005 Lawrence, KS - USA
- MTV architecture framework (==MVC)
- Django Software Foundation
- BSD license
- Used in: Pinterest, Instagram, Bitbucket, Sentry

Trivia



Batteries included

- core: ORM, urls, templates (pluggable), i18n, migrations
- contrib apps: admin, auth, sessions, postgres (e.g. jsonb field)
- tons of third party apps and libs

A (silly) Todo application

Environment setup

```
$ sudo apt-get install python  
python-virtualenv  
$ virtualenv venv  
$ . venv/bin/activate  
(venv)$ pip install django
```

Project bootstrapping

```
$ django-admin startproject  
djangotcs  
$ find  
./djangotcs  
./djangotcs/urls.py  
./djangotcs/___init___.py  
./djangotcs/wsgi.py  
./djangotcs/settings.py  
./manage.py  
./db.sqlite3
```

Let's do something

```
$ manage.py startapp todo
$ mkdir -p todo/templates/todo
$ find todo/
todo/
todo/migrations
todo/migrations/__init__.py
todo/__init__.py
todo/templates
todo/templates/todo
todo/views.py
todo/models.py
todo/admin.py
todo/tests.py
```

todo/models.py

```
# -*- coding: utf-8 -*-  
from django.db import models  
  
class Todo(models.Model):  
    name = models.CharField(max_length=255)  
  
    def __unicode__(self):  
        return self.name  
  
class TodoItem(models.Model):  
    text = models.TextField()  
    todo = models.ForeignKey(Todo)  
  
    def __unicode__(self):  
        return self.text
```


todo/forms.py

```
# -*- coding: utf-8 -*-  
from django import forms  
from .models import Todo, TodoItem  
  
class TodoForm(forms.ModelForm):  
    class Meta:  
        model = Todo  
        fields = ('name',)  
  
class TodoItemForm(forms.ModelForm):  
    class Meta:  
        model = TodoItem  
        fields = ('todo', 'text',)
```

todo/views.py

```
from django.shortcuts import render, redirect, get_object_or_404
from .models import Todo, TodoItem
from .forms import TodoForm, TodoItemForm

def index(request):
    return render(request, "todo/index.html", {'todos': Todo.objects.all()})

def detail(request, todo_id):
    todo = get_object_or_404(Todo, pk=todo_id)
    return render(request, "todo/detail.html", {'todo': todo})

def new_todo(request):
    if request.method == 'POST':
        form = TodoForm(request.POST)
        if form.is_valid():
            todo = form.save()
            return redirect('todo:index')
    else:
        form = TodoForm()
    return render(request, "todo/new.html", {'form': form})
```

todo/templates/todo/new.html

```
{% extends 'todo/base.html' %}
```

```
{% block title %}
```

Add a new todo

```
{% endblock %}
```

```
{% block content %}
```

```
<form action="" method="POST">
```

```
{% csrf_token %}
```

```
{{ form.as_p }}
```

```
<input type="submit" value="Add">
```

```
</form>
```

```
{% endblock %}
```

todo/urls.py

```
# -*- coding: utf-8 -*-
from django.conf.urls import url
from . import views

urlpatterns = [
    url(r'^$', views.index, name="index"),
    url(r'^add$', views.new_todo, name="new_todo"),
    url(r'^(?P<todo_id>\d+)$', views.detail,
name="detail"),
    url(r'^(?P<todo_id>\d+)/item/add$', views.add_item,
name="add_item"),
    url(r'^(?P<todo_id>\d+)/item/(?
P<item_id>\d+)/remove$', views.remove_item,
name="remove_item"),
]
```

todo/admin.py

```
# -*- coding: utf-8 -*-  
from django.contrib import admin  
from .models import Todo, TodoItem  
  
class TodoItemInline(admin.StackedInline):  
    model = TodoItem  
  
class TodoAdmin(admin.ModelAdmin):  
    inlines = [  
        TodoItemInline,  
    ]  
  
admin.site.register(Todo, TodoAdmin)
```

djangotcs/settings.py (excerpt)

```
INSTALLED_APPS = (  
    'django.contrib.admin',  
    'django.contrib.auth',  
    'django.contrib.contenttypes',  
    'django.contrib.sessions',  
    'django.contrib.messages',  
    'django.contrib.staticfiles',  
    'todo',  
)  
  
ROOT_URLCONF = 'djangotcs.urls'  
  
DATABASES = {  
    'default': {  
        'ENGINE': 'django.db.backends.sqlite3',  
        'NAME': os.path.join(BASE_DIR, 'db.sqlite3'),  
    }  
}
```

django_tcs/urls.py

```
# -*- coding: utf-8 -*-  
from django.conf.urls import patterns,  
include, url  
from django.contrib import admin  
  
urlpatterns = patterns('',  
    url(r'^admin/',  
include(admin.site.urls)),  
    url(r'^todo/', include('todo.urls',  
namespace="todo")),  
)
```

Migration time

```
$ ./manage.py makemigrations todo
```

```
Migrations for 'todo':
```

```
0001_initial.py:
```

- Create model Todo
- Create model TodoItem

```
$ ./manage.py migrate
```

```
Operations to perform:
```

```
Apply all migrations: admin, contenttypes, auth,  
sessions, todo
```

```
Running migrations:
```

```
Applying contenttypes.0001_initial... OK
```

```
Applying auth.0001_initial... OK
```

```
Applying admin.0001_initial... OK
```

```
Applying sessions.0001_initial... OK
```

```
Applying todo.0001_initial... OK
```


built-in http server with hot code reload

```
$ ./manage.py runserver  
Performing system checks...
```

```
System check identified no issues (0 silenced).
```

```
September 16, 2015 - 22:00:50
```

```
Django version 1.8.4, using settings  
'djangotcs.settings'
```

```
Starting development server at http://127.0.0.1:8000/
```

```
Quit the server with CONTROL-C.
```

A more serious stack

- web server: nginx
- application server container + lot more: uwsgi
- database: postgres
- data structure store / cache: redis

Modern Times

SPA

- (too?) trivial to add rest interface to models
<https://django-rest-framework.org>
- react: server side jsx compiling (via nodejs)
<https://github.com/markfinger/python-react>
- angular: trivial conflict with angular default
\$interpolateProvider

What about the realtime web?

- python 3.5 added async / await coroutines (or gevent)
- django not async friendly (especially ORM)
- tradeoff: offload realtime to another process with redis pub/sub
- please remember: 99% non-blocking is still blocking

Age of microservices

- do we need different kind of batteries?
- easy deploy as important as dev productivity?

Resources

Python resources

- [Learn python the hard way](#)
- [PythonAnywhere: try python in the cloud](#)
- [ml python-it](#)

Django resources

- [django girls tutorial](#)
- [official tutorial](#)
- [ml django-it](#)

Todo demo app

Incomplete, pull requests welcome! :)

<https://github.com/xrmx/tcs-djangodemopap>

Happy Hacking :)

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