



Django Web Framework: A Comprehensive Introduction and Step by Step Installation

Abstract

One of the emerging framework in python is Django framework which follows the MVT pattern for implementation. Django is an open source framework that facilitates user to create the secure website with advance features in minimum duration and efforts. One of the advance benefit of the Django framework it comes with built in admin functionality. The developer just need to setup the environment for the admin. Django partially follows the model view controller pattern but for the implementation it also follows the MVT pattern.

History of python and Django framework

Django, the open source framework, began as a project by The World Company of Lawrence, Kansas. In order to keep up with the intense demands of journalism, the developers at the Lawrence-Journal World began developing web applications to expedite the process of delivering news. In the fall of 2003, these developers decided to move away from PHP and pick up Python as their main development language [1]. In the summer of 2005, World Online decided to release this new framework as open-source software. Ironically, this increasingly popular framework was built upon open-source software [2]. Prior to Django's release as open-source software, the web framework underwent the process of naming. For the sake of humor, one of the original developers (Jacob Kaplan-Moss) released some of the thrown-away names that were considered in his blog itself, including Apache, Python and PostgreSQL [3].

Features of Django framework

Django framework has many advance features which helps web developers to easily create the website in time savvy environment. The main features are tight integration between different component of web application in short we can say that it allows the reusability of the code across the web application. It also has the feature of object relational mapper that helps to support the bulky database system with large data set processing. The unique feature of the Django is clean URL mapping. This feature allows to create the design pattern of the URL with which developer can create user friendly and search engine friendly URL. The other time savvy feature is the automatic administration of your application. It also provides the multi lingual support for the web site.

Django MVT pattern with file structure

As I described earlier Django partially follows the MVC pattern but for the implementation it follows the MVT pattern

In Django it is called MTV rather than MVC

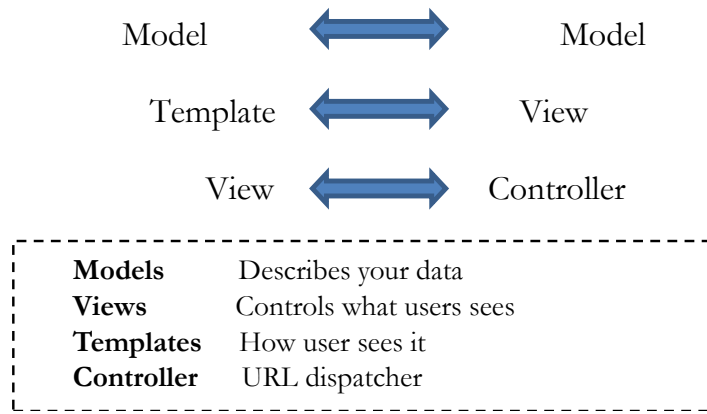


Figure 1: Django MVT pattern

Django, in particular, uses an mvt pattern. In this pattern, views are replaced by templates and controllers are replaced by views. In the rest of this book, we will be using mvt patterns. Hence, our html code will be templates, and our python code will be views and models.

Installation of Django web framework in windows

The installation steps are as follows, but kindly note Before following next step just make sure to install python

1. python environment variable setup for Django Setup environment variables in windows system settings under advanced settings: e.g. C:\Python34;C:\Python34\python.exe;c:\Python34\scripts\;c:\Python34\lib\site-packages\django\bin;

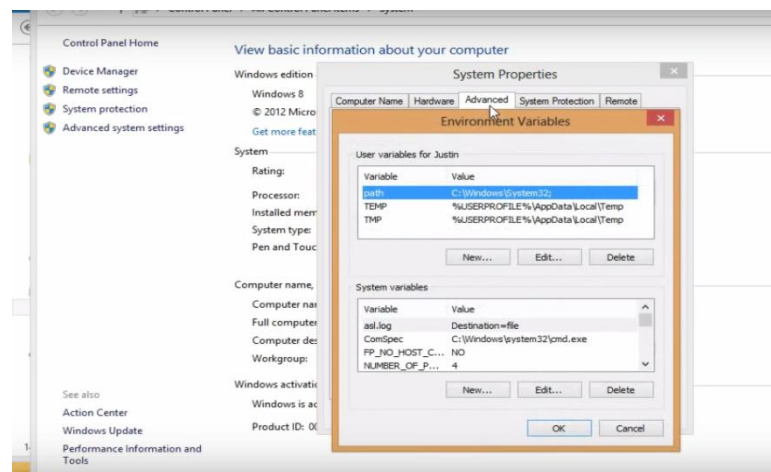


Figure 1 : Environment variable setup of python

2. after setting variable now verify whether it has been setup or not. For that just open the command prompt and type as bellow

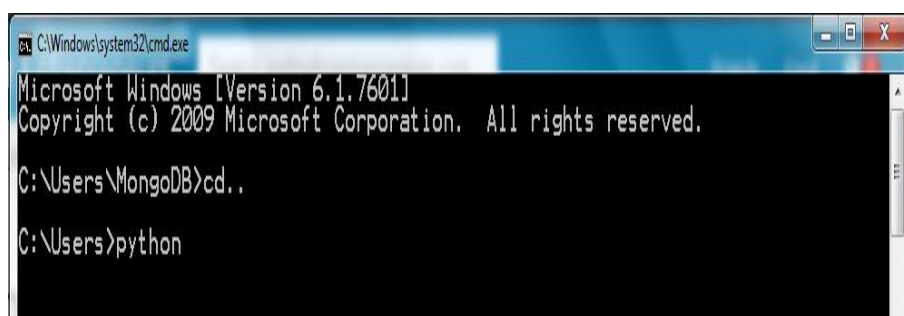


Figure 2 : Python environment setup verification

```

C:\Windows\system32\cmd.exe - python
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\MongoDB>cd..

C:\Users>python
Python 3.4.0 (v3.4.0:04f714765c13, Mar 16 2014, 19:24:06) [MSC v.1600 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>>

```

Figure 3: Output of the above command

3. Now type **pip** on the command prompt

```

C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\MongoDB>pip

Usage:
  pip <command> [<options>]

Commands:
  install           Install packages.
  download          Download packages.
  uninstall         Uninstall packages.
  freeze           Output installed packages in requirements format.
  list             List installed packages.
  show            Show information about installed packages.
  check           Verify installed packages have compatible dependencies.
  search          Search PyPI for packages.
  wheel           Build wheels from your requirements.
  hash           Compute hashes of package archives.
  completion     A helper command used for command completion.
  help           Show help for commands.

General Options:
  -h, --help           Show help.
  --isolated          Run pip in an isolated mode, ignoring environment variables and user configuration.
  -v, --verbose       Give more output. Option is additive, and can be used up to 3 times.
  -V, --version       Show version and exit.
  -q, --quiet         Give less output. Option is additive, and can be used up to 3 times (corresponding to WARNING, ERROR, and CRITICAL logging levels).
  --log <path>       Path to a verbose appending log.
  --proxy <proxy>    Specify a proxy in the form User:passwd@proxy.server:port.
  --retries <retries> Maximum number of retries each connection should

```

Figure 4: Output of the above command

4. Virtual environment variable setup for Django : Type pip freeze from command prompt and then press enter

```

--proxy <proxy>          inactive by default.
                        Specify a proxy in the form
                        User:passwd@proxy.server:port.
--timeout <sec>         Set the socket timeout (default 15 seconds).
--exists-action <action> Default action when a path already exists:
                        (s)witch, (i)gnore, (w)ipe, (b)ackup.
--cert <path>          Path to alternate CA bundle.

C:\Users\Justin>pip freeze
C:\Users\Justin>

```

Figure 5: Output of the above command

5. Now type pip install virtualenv

```

--proxy <proxy>          inactive by default.
                        Specify a proxy in the form
                        User:passwd@proxy.server:port.
--timeout <sec>         Set the socket timeout (default 15 seconds).
--exists-action <action> Default action when a path already exists:
                        (s)witch, (i)gnore, (w)ipe, (b)ackup.
--cert <path>          Path to alternate CA bundle.

C:\Users\Justin>pip freeze

C:\Users\Justin>pip install virtualenv
Downloading/unpacking virtualenv
Installing collected packages: virtualenv
Successfully installed virtualenv
Cleaning up...

C:\Users\Justin>

```

Figure 6: Output of the above command

Type **pip freeze** again from the command prompt to see the virtual environment install

6. Now create virtual environment , type `virtualenv <virtual environment name>` e.g. `virtualenv venv`

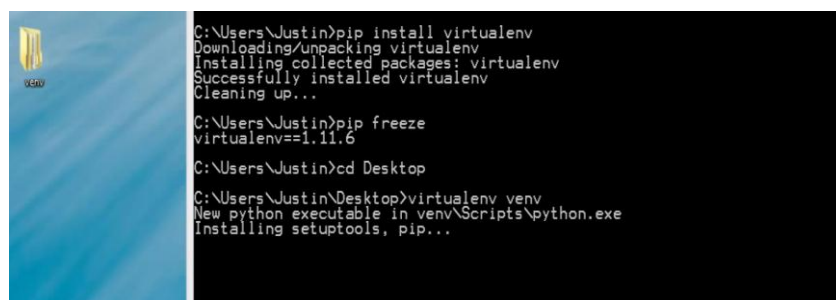
```
C:\Users\Justin>pip freeze
virtualenv==1.11.6

C:\Users\Justin>cd Desktop

C:\Users\Justin\Desktop>virtualenv venv
New python executable in venv\Scripts\python.exe
```

Figure 7: Output of the above command

Now you can see the folder name venv has been created at your path e.g here folder is created on desktop you can



```
C:\Users\Justin>pip install virtualenv
Downloading/unpacking virtualenv
Installing collected packages: virtualenv
Successfully installed virtualenv
Cleaning up...

C:\Users\Justin>pip freeze
virtualenv==1.11.6

C:\Users\Justin>cd Desktop

C:\Users\Justin\Desktop>virtualenv venv
New python executable in venv\Scripts\python.exe
Installing setuptools, pip...
```

Figure 8: Output of the above command

After successful folder creation go inside the folder name venv from cmd e.g. type `cd venv` from cmd. Now it's time to activate the virtual environment for that type `.\scripts\activate` on command prompt as shown below:

```
06/19/2014 04:37 PM <DIR>          LIB
06/19/2014 04:37 PM <DIR>          Scripts
0 File(s)          0 bytes
5 Dir(s) 1,843,233,329,152 bytes free

C:\Users\Justin\Desktop\venv>.\Scripts\activate
(venv) C:\Users\Justin\Desktop\venv>
```

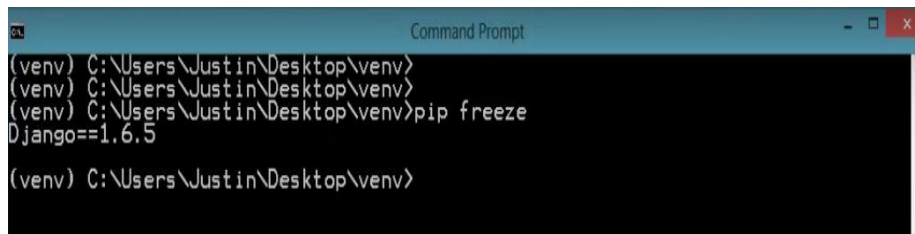
Figure 9: Activating virtual environment

7. Now it's a time to install Django for this virtual environment type `pip install django` from command prompt

```
C:\Users\Justin\Desktop\venv>.\Scripts\activate
(venv) C:\Users\Justin\Desktop\venv>deactivate
C:\Users\Justin\Desktop\venv>.\Scripts\activate
(venv) C:\Users\Justin\Desktop\venv>pip freeze
(venv) C:\Users\Justin\Desktop\venv>pip install django
```

Figure 10: Output of the above command

If you want to check whether it is successfully installed or not, type `pip freeze` on command prompt



```

Command Prompt
(venv) C:\Users\Justin\Desktop\venv>
(venv) C:\Users\Justin\Desktop\venv>
(venv) C:\Users\Justin\Desktop\venv>pip freeze
Django==1.6.5
(venv) C:\Users\Justin\Desktop\venv>

```

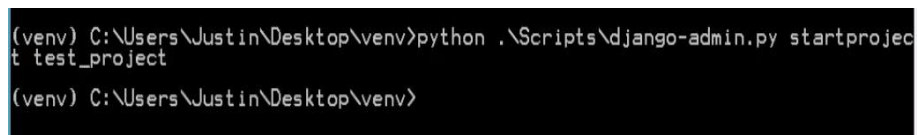
Figure 11: Output of the above command

You can see the Django version as output on the screen.

8. Creating an empty project : To create your first Django project type the following command, and hit enter: `Python . \scripts\django-admin.py startproject yourprojectname`

e.g.

`Python . \scripts\django-admin.py startproject testproject`



```

(venv) C:\Users\Justin\Desktop\venv>python . \Scripts\django-admin.py startproject
test_project
(venv) C:\Users\Justin\Desktop\venv>

```

Figure 12: Output of the above command

Now you can see testproject inside your virtual environment folder name e.g. venv

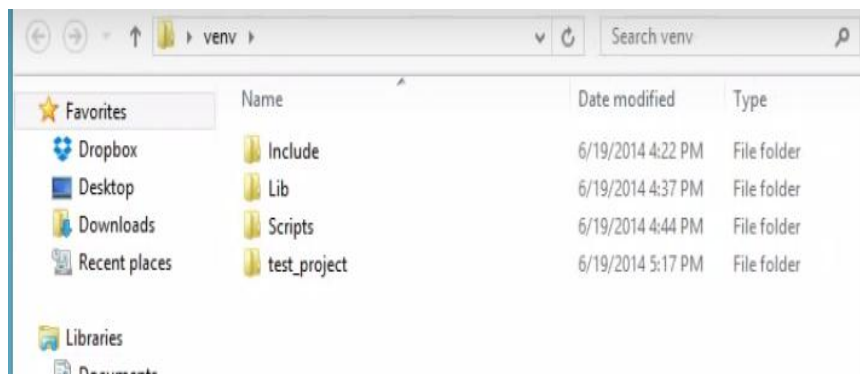
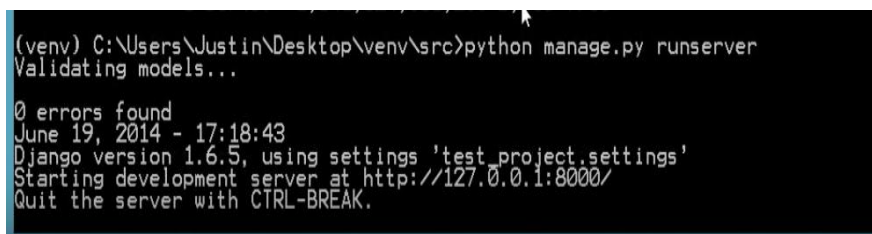


Figure 13: Output of the above command

Now type `cd testproject` from cmd to go inside the testproject directory. Now it's a time to start a server for that type `Python manage.py runserver` from the project directory from cmd



```

(venv) C:\Users\Justin\Desktop\venv\src>python manage.py runserver
Validating models...

0 errors found
June 19, 2014 - 17:18:43
Django version 1.6.5, using settings 'test_project.settings'
Starting development server at http://127.0.0.1:8000/
Quit the server with CTRL-BREAK.

```

Figure 14: Output of the above command

You can see your server has been started successfully. To check please type your server url given on command prompt e.g 127.0.0.1:8000 on browser.

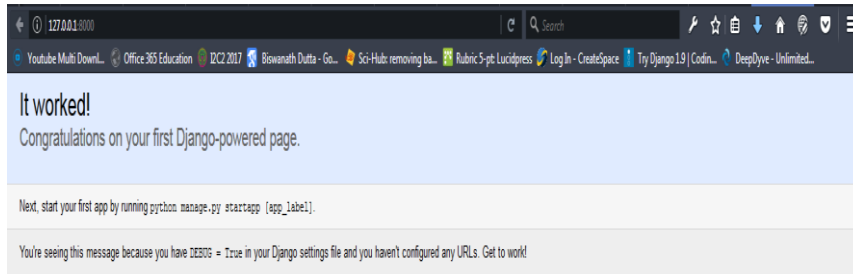


Figure 15: Django successfully setup screen

8. Creating a super user of the project To create a super user of the project type python manage.py migrate

It will ask you to enter username & password for the super user

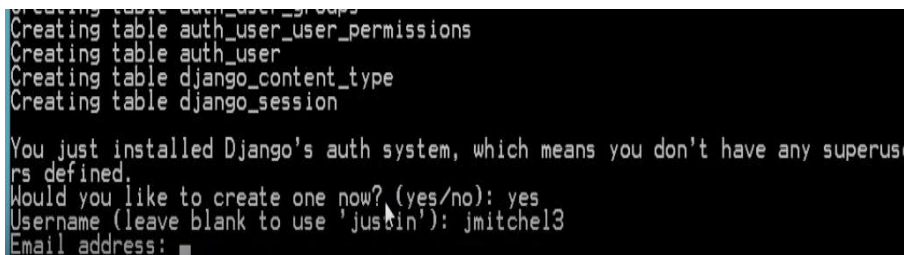


Figure 16: Output of the above command

Now to check whether it is successfully created or not just run the server as described above, and open the browser and type e.g 127.0.0.1:8000/admin

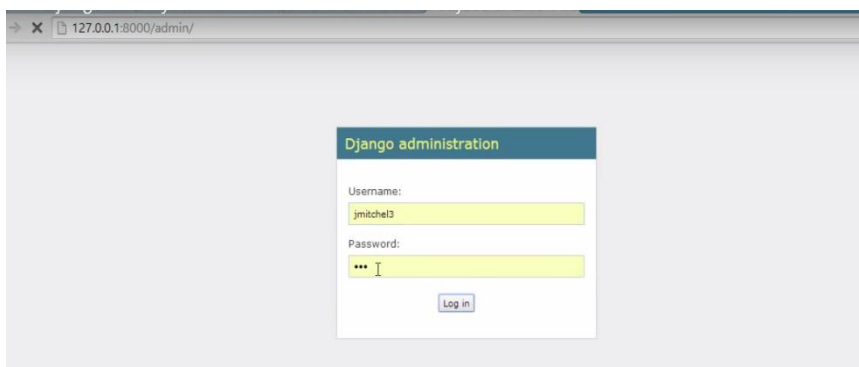


Figure 17: Django admin panel login



Figure 17: Django admin dashboard

Reference

- I. <https://docs.djangoproject.com/en/dev/faq/general/#why-does-this-project-exist>
- II. <https://docs.djangoproject.com/en/dev/faq/general/#why-does-this-project-exist>
- III. http://jacobian.org/writing/private_dancer/
- IV. <https://django-simple-history.readthedocs.io/en/latest/>
- V. <https://djangosnippets.org/>
- VI. <https://www.djangoproject.com/>

Prof. Ripal Ranpara

Department of Computer Science & IT

Shree M. & N. Virani Science College (Autonomous)

Rajkot

Copyright © 2012 – 2017 KCG. All Rights Reserved. | Powered By: Knowledge Consortium of Gujarat