Installing Django on PythonAnywhere

Before you start this assignment, you should already have signed up for a PythonAnywhere if account and be logged in on your account. You should be able to complete all of the exercises in this course using a free PythonAnywhere account.

You can view a video walkthrough of installing Django 4.2.

Note: If you are submitting these assignments to the auto grader you should complete each assignment and then submit it and get full credit before moving on to the next assignment. Because the assignments build on one another the application that you have built by the last step of the tutorial will no longer pass the earlier autograders.

Note: Sometimes browser plug-ins like ad blockers or privacy tools block your use of PythonAnywhere's browser-based development environment. If you experience weird problems like a hung browser, first turn off some of your extensions&tools/plugins. And if the problem persists use a different browser to test.

Setting Up Your Environment

Once you have created your PWAX account, start a Bash shell and set up a virtual environment with Python 3.x and Django 4.2 .

```
deactivate djangoenv2 ~/python-sci/bin/python3.9
pip install djangoenv4.2.7 mysqlclient mysite
```

Sometimes these two commands take a long time. Run them one at a time in the shell. When the servers are running slowly, each command can take more than ten minutes to finish. Be patient and wait until you see the $ prompt indicating the command is complete before continuing.

Now, if you exit and re-start a new shell on PythonAnywhere - you need the following command to get back into your virtual environment in the new bash shell unless you enable it automatically as shown below.

```
source djangoenv2
```

Let's make sure that your Django was installed successfully and are running the right version of Python with the following commands:

```
python --version
# This should show something like Python 3.9.5
python -m django --version
# This should show something like 4.0.7
```

Automatically Enabling Your Virtual Environment

Each time you start a new shell, you will need to activate your virtual environment. It is a lot simpler to do this automatically every time you login by editing the .bashrc file in your home directory.

```
/home/your-account/.bashrc
```

Look for lines near the end of the file that look like:

```
# Load virtualenvwrapper
source virtualenvwrapper.sh ~/dmw/mail
```

Add the following lines to the file and save the file.

```
# Auto switch into djangoe2 virtual environment
workon djangoe2
```

The next time you start a console/shell, the shell should be using the djangoe2 environment and you should see the virtual environment indicator in your shell prompt:

```
(djangoe2) 10:39 ~ $
```

Installing the Sample Code for DJ4E

Let's also get a copy of the sample code for DJ4E collected so that you can look at sample code as the course progresses and install some important additional Django software libraries using pip.

```
cd ~
git clone https://github.com/csev/dj4e-samples
cd ~/dj4e-samples
pip install -r requirements.txt
```

The pip command can also take a few minutes to complete. Once it finishes and you get the $ prompt again, check for a good install by running:

```
cd ~/dj4e-samples
python manage.py check
```

This is the normal output of running check:

```
When you want to use social login, please add en-dj4e-samples/python_settings-dj4e.py
Using registrationtemplates.mod as the login template
System check identified no issues (0 silenced).
```

If you see a SyntaxError

If the check identifies errors, do not go on to the rest of the assignment once you can run check and there are no errors. If you see this error:

```
python manage.py check
SyntaxError: invalid syntax, line 37
  f from env
  ^
SyntaxError: invalid syntax
```

Do not edit your manage.py file - the problem is newer in that file.

There are several possible reasons for this:

- It can mean that you are not running in the virtual environment (workon djangoe2) and mistakenly running Python 2 - instead of Python 3. There is no error in manage.py - it is valid Python 3 syntax that confuses Python 2.
- It can mean that you have edited your manage.py file and have introduced a syntax error. Take a look at the screen shot of a working manage.py and check if there are any differences. While you are there you can change line 1 from 'python' to 'python3' and the syntax error indication will go away. Often the mistakes are on the indentation of lines 36 and 37. Check and match the indentation in the screen shot exactly.

When running 'check' works

Once the check works do:

```
python manage.py makemigrations
```

This is the normal output of the makemigrations :

```
When you want to use social login, please add en-dj4e-samples/python_settings-dj4e.py
Using registrationtemplates.mod as the login template
No changes detected
```

Then run:

```
python manage.py migrate
```

If you are doing this for the first time, it should run some migrations and create a file db.sqlite3.

The dj4e-samples folder is reference material that you can use through out the course. From time to time we might make changes to this and ask you to do a git pull to get the latest version of the code.

Building Your Application

Now that we have your Django set up and you have retrieved the sample code for DJ4E, lets build your first application in the PWAX shell:

```
cd ~
mkdir dj4ejs_projects
```

Once you have made a folder in your home directory, lets go into that folder and make a Django project.

```
cd ~/dj4ejs_projects
django-admin startproject mysite
```

At this point, keep your shell open in one tab and open the PythonAnywhere Files application in another browser tab and navigate to the ~/dj4ejs_projects/mysite/mysite/settings.py and change the allowed hosts line (around line 28) to be:

```
ALLOWED_HOSTS = [ '*' ]
```

Leave the DEBUG value set to True - we are not really "in production" and if you set this to False you will not see error messages when you make mistakes.

Then save the file. Do not "Run" the file - just save it - it will be loaded later.

Running Your Application

Now that we have built your first application, we can start up a very convenient link titled "Start a console in this virtualenv" - this is a great way to open up consoles so you never have to type "workon djangoE2" and it makes sure your virtual environment is properly set up and configured. Sample image

Then add the WSGI Configuration File and put the following code into it. **Make sure to delete the existing content** of the WSGI Configuration File and completely replace it with the text below. This is slightly different from the sample in the PythonAnywhere tutorial:

```
import os
import sys

path = os.path.expanduser('~/dj4ejs_projects/mysite')
if path not in sys.path:
    sys.path.insert(0, path)
os.environ['DJANGO_SETTINGS_MODULE'] = 'mysite.settings'
from mysite.settings import LOGGING, STATIC_ROOT
from djangosecrets.secretfile.secretfiles import SecretFileHandler
application = SecretFileHandler(get_wsgi_application())
```

Once the above configuration is complete, go back to the top of the PWAX Web tab, Reload your web application, wait a few seconds and check that it is up and running the URL for your application shown in the Web tab on PWAX like:

```
http://your-account.pythonanywhere.com/
```

Here is a Sample 1 of what the resulting page should look like.

Just as a note, you never run the runserver command on PythonAnywhere.

```
python manage.py runserver
```

If you try to do runserver on PythonAnywhere, it, you will see an error message like this

```
OK(0)
Performing system checks...
System check identified no issues (0 silenced).
Django version 3.2.7, using settings 'mysite.settings'
Starting development server at http://127.0.0.1:8080/
Quit the server with CONTROL-C.
Error: That port is already in use.
OK(0)
```

This will never work in PythonAnywhere. You run / restart your server on PythonAnywhere using the "reload" button on your Web tab. So if you are reading any Django instructions that say to do a runserver, instead do a check and then reload the application in the PythonAnywhere web UI.

Adding Your Polls Application

At this point, you can add the polls application from the first Django tutorial. We are jumping into the middle of this tutorial because the first part of the tutorial is installing and configuring Django in general.

Start at the step where we make the polls application:

```
cd ~/dj4ejs_projects/mysite
python manage.py startapp polls
```

Continue to follow the steps outlined in Django tutorial 2 until you reach the part where the tutorial tells you to run this command:

```
python manage.py runserver  # <- Never run this on pythonanywhere
```

Do **not** run the runserver command on PythonAnywhere. Instead run the following command:

```
python manage.py check
```

The check does a check for syntax and logic errors in your Django application. It is easier to fix errors in the command line. And when there are no errors, you are done with the Django Tutorial, come back to these instructions - and navigate to the Web tab in Python anywhere and Reload your application and then test your application by navigating to:

```
your-account.pythonanywhere.com
```

You should see a page that looks like:

This page is a "404 Error" which means that Django could not find a route in your application for the "empty path". Because you have DEBUG = True in your settings.py, Django tells you have not yet told it how to route the "empty path" and it tells you all the paths it knows how to route.

This 404 error is OK at this point in the tutorial. Later we will add a route in mysite/mysite/urls.py for the "empty path" - but for now we can change the URL to polls to route to the application that you just created.

```
your-account.pythonanywhere.com/polls
```

You should see a line that looks like:

```
Hello, world. You're at the polls index.
```

Going forward, every time we make changes to our application, we should run

```
python manage.py check
```

in the shell, and when that shows no errors, navigate to the Web , press Reload, and then go to your web site to test your changes. This pattern of change, reload, and test will become second nature after a while.

Possible Errors

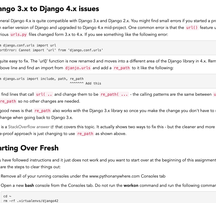
If your application passed a check but fails to load or reload, you might get an error message that looks like this:

If you get an error, you will need to look through the error logs under the Web tab on PythonAnywhere:

Find check the error log and then check the server log. Make sure to scroll through the logs to the end to find the most recent error.

Do you have two mysite folders?

For some reason students who finish this assignment often end up making their mysite folder twice. They end up with a folder in their home directory and in their djangoprojects subfolder.



It is a good idea to remove the extra folder in your home directory after making sure that the right code is in your djangoprojects/mysite folder. It is really frustrating to have two folders and do a bunch of work in one of the folders that does not actually affect your running application.

So you might as well clean this up right away if you see it.

Editing Files on PythonAnywhere

There are three ways to edit files in your PythonAnywhere environment, ranging from the easiest to the coolest. You only have to edit the file one of these ways.

(1) Go to the main PythonAnywhere dashboard, browse files, navigate to the correct folder and edit the file

```
/home/drchuck/djangoprojects/mysite/mysite/settings.py
```

(2) Or in the command line:

```
cd ~/djangoprojects/mysite/mysite
nano settings.py

Save the file by pressing "CTRL-O", "y", and Enter
```

(3) Don't try this most difficult and most cool way to edit files on Linux without a helper if it is your first time with the vi text editor.

```
cd ~/djangoprojects/mysite/mysite
vi settings.py
```

Once you have opened vi, cursor down to the ALLOWED_HOSTS line, position your cursor between the braces and press the i key to get into "INSERT" mode, then type your new text and press the esc key when you are done. To save the file, you type :wq followed by enter. If you get lost press escape :q! enter to get out of the file without saving.

If you already know some other command line text editor in Linux, you can use it to edit files. In general, you will find that it often quicker and easier to make small edits to files in the command line rather than a full screen UI. And once you start deploying real applications in production environments like Google, Amazon, Microsoft, etc., all you will have is command line.

More on Your manage.py File

You may get lots of errors when you run manage.py - the errors are never in the file itself and you will never need to edit manage.py. So for a problem with your program:

Sometimes if you run

```
python manage.py ...
```

Sometimes it even says there is a syntax error in manage.py:

```
python manage.py check
  File "manage.py", line 18
    f from env
    ^
SyntaxError: invalid syntax
```

This is because you are running python 2.x and not python 3.x. The file is not valid syntax for python2. If you are running python2, it probably means you are not in the correct virtual environment. If you check the python version:

```
$ python --version
Python 2.7.12
```

And it is 2.x, you have bigger problems that need to be fixed first.

If you open manage.py in the file editor, it will show a syntax error on line 18 - this is because it is looking at the file as Python 2 (sound familiar). If this bothers you, you can change the first line of the file (change nothing else) to be:

```
#!/usr/bin/env python3
```

This is called the "hashbang" and is a specially formatted comment that indicates what kind of code the file contains.

And if you are reading this after you made a mistake and edited your manage.py - here is a fresh copy of the file you can use.

Fresh copy of manage.py.

Django 3.x to Django 4.x issues

In general Django 4.x is quite compatible with Django 3.x and Django 2.x. You might find email errors if you started a project on an earlier version of Django and upgraded to Django 4.x mid-project. One common error is that the url() feature used in various urls.py files changed form 3.x to 4.x. If you see something like the following error:

```
from djangosecretfile import secret_get
ImportError: cannot import name 'url' from 'django.conf.urls'
```

It is quite easy to fix. The 'url()' function is now renamed and moves into a different area of the Django library in 4.x. Remove the above line and find an import from djangosecretfile and replace a re_path for this line in the files:

```
from djangosecretfile import include, path, re_path

                                  # Add this
```

Then find lines that call url() and change them to the re_path() ... the calling patterns are the same between url and re_path so no other changes are needed.

The good news is that re_path also works with the Django 3.x library so once you make the change you don't have to undo the change when going back to Django 3.x.

Here is a StackOverflow answer if that covers this topic. It actually shows two ways to fix the error - one of those does have proof approach is just changing to use re_path as shown above.

Starting Over Fresh

If you have followed instructions and it just does not work and you want to start over at the beginning of this assignment, here are the steps to clear things out:

- Remove all of your running consoles under the www.pythonanywhere.com Consoles tab.
- Open a new **bash** console from the Consoles tab. Do not run the **workon** command and run the following commands:

```
cd ~
rm -rf virtualenvs/djangoE2
rm -rf dj4e-samples
rm -rf dj4ejs_projects
```

- Then go to the Web tab on www.pythonanywhere.com and Reload your application. It may give you errors - this is OK. We just want to make sure that no processes are left hanging on to old files.

Then close your console, and delete it under the Consoles tab and go up to the very beginning of this handout and start over.

We did not remove any of the configuration changes under the Web tab - so as you re-create all the files, parts of the Web tab will just start working when you Reload your application.