

```
user@box: ~  
File Actions Edit View Help  
user@box: ~  
user@box:~$ pip3 -V  
pip 20.0.2 from /usr/lib/python3/dist-packages/pip (python 3.8)  
user@box:~$ pip3list  
pip3list: command not found  
user@box:~$ pip3 list  
Package                                Version  
-----  
apt-xapian-index                       0.49  
astral                                 2.2  
blinker                                1.4  
certifi                                2019.11.28  
chardet                                3.0.4  
command-not-found                     0.3  
cryptography                           2.8  
cupshelpers                            1.0  
dbus-python                            1.2.16  
defer                                  1.0.6  
distro                                 1.4.0  
distro-info                            0.23ubuntu1  
entrypoints                            0.3  
galternatives                          1.0.6  
geographiclib                          1.52  
geopy                                  2.2.0
```

```
idna                                    2.8  
jdcal                                  1.4.1  
keyring                                18.0.1  
language-selector                     0.1  
launchpadlib                           1.10.13  
lazr.restfulclient                     0.14.2  
lazr.uri                               1.0.3  
lubuntu-update-notifier                0.1  
netifaces                              0.10.4  
oauthlib                               3.1.0  
olefile                                0.46  
pexpect                                4.6.0  
Pillow                                 7.0.0  
pip                                     20.0.2  
psutil                                 5.9.0  
pycairo                                1.16.2  
pycups                                 1.9.73  
PyGObject                              3.36.0  
PyJWT                                   1.7.1  
pymacaroons                            0.13.0  
PyNaCl                                  1.3.0  
PyQt5                                   5.14.1  
python-apt                             2.0.0
```

```
python-debian 0.1.36ubuntu1
pytz 2021.3
pyxdg 0.26
PyYAML 5.3.1
reportlab 3.5.34
requests 2.22.0
requests-unixsocket 0.2.0
SecretStorage 2.3.1
setuptools 45.2.0
simplejson 3.16.0
sip 4.19.21
six 1.14.0
systemd-python 234
ubuntu-advantage-tools 20.3
ubuntu-drivers-common 0.0.0
ufw 0.36
unattended-upgrades 0.1
urllib3 1.25.8
usb-creator 0.3.7
wadllib 1.3.3
wheel 0.34.2
xkit 0.0.0
```

```
user@box:~$ sudo pip3 install -U setuptools
[sudo] password for user:
Collecting setuptools
  Downloading setuptools-60.9.3-py3-none-any.whl (1.1 MB)
    |████████████████████████████████████████| 1.1 MB 416 kB/s
ERROR: launchpadlib 1.10.13 requires testresources, which is not installed.
Installing collected packages: setuptools
  Attempting uninstall: setuptools
    Found existing installation: setuptools 45.2.0
    Not uninstalling setuptools at /usr/lib/python3/dist-packages, outside environment /usr
    Can't uninstall 'setuptools'. No files were found to uninstall.
Successfully installed setuptools-60.9.3
```

```
user@box:~$ sudo pip3 install -U django
/usr/local/lib/python3.8/dist-packages/pkg_resources/__init__.py:122: PkgResourcesDeprecationWarning: 0.23ubuntu1 is an invalid version and will not be supported in a future release
  warnings.warn(
/usr/local/lib/python3.8/dist-packages/pkg_resources/__init__.py:122: PkgResourcesDeprecationWarning: 0.1.36ubuntu1 is an invalid version and will not be supported in a future release
  warnings.warn(
Collecting django
  Downloading Django-4.0.2-py3-none-any.whl (8.0 MB)
  |████████████████████████████████████████| 8.0 MB 233 kB/s
Collecting asgiref<4,>=3.4.1
  Downloading asgiref-3.5.0-py3-none-any.whl (22 kB)
Collecting sqlparse>=0.2.2
  Downloading sqlparse-0.4.2-py3-none-any.whl (42 kB)
  |████████████████████████████████████████| 42 kB 222 kB/s
Collecting backports.zoneinfo; python_version < "3.9"
  Downloading backports.zoneinfo-0.2.1-cp38-cp38-manylinux1_x86_64.whl (74 kB)
  |████████████████████████████████████████| 74 kB 449 kB/s
Installing collected packages: asgiref, sqlparse, backports.zoneinfo, django
Successfully installed asgiref-3.5.0 backports.zoneinfo-0.2.1 django-4.0.2 sq
```

```
user@box:~$ sudo pip3 install -U djangoestframework
/usr/local/lib/python3.8/dist-packages/pkg_resources/__init__.py:122: PkgResourcesDeprecationWarning: 0.23ubuntu1 is an invalid version and will not be supported in a future release
  warnings.warn(
/usr/local/lib/python3.8/dist-packages/pkg_resources/__init__.py:122: PkgResourcesDeprecationWarning: 0.1.36ubuntu1 is an invalid version and will not be supported in a future release
  warnings.warn(
Collecting djangoestframework
  Downloading djangoestframework-3.13.1-py3-none-any.whl (958 kB)
  |████████████████████████████████████████| 958 kB 496 kB/s
Requirement already satisfied, skipping upgrade: django>=2.2 in /usr/local/lib/python3.8/dist-packages (from djangoestframework) (4.0.2)
Collecting pytz
  Downloading pytz-2021.3-py2.py3-none-any.whl (503 kB)
  |████████████████████████████████████████| 503 kB 2.0 MB/s
Requirement already satisfied, skipping upgrade: asgiref<4,>=3.4.1 in /usr/local/lib/python3.8/dist-packages (from django>=2.2->djangoestframework) (3.5.0)
Requirement already satisfied, skipping upgrade: sqlparse>=0.2.2 in /usr/local/lib/python3.8/dist-packages (from django>=2.2->djangoestframework) (0.4.2)
Requirement already satisfied, skipping upgrade: backports.zoneinfo; python_v
```

```
user@box:~$ sudo pip3 install -U django-filter
/usr/local/lib/python3.8/dist-packages/pkg_resources/__init__.py:122: PkgResourcesDeprecationWarning: 0.23ubuntu1 is an invalid version and will not be supported in a future release
  warnings.warn(
/usr/local/lib/python3.8/dist-packages/pkg_resources/__init__.py:122: PkgResourcesDeprecationWarning: 0.1.36ubuntu1 is an invalid version and will not be supported in a future release
  warnings.warn(
Collecting django-filter
  Downloading django_filter-21.1-py3-none-any.whl (81 kB)
    |████████████████████████████████████████| 81 kB 302 kB/s
Requirement already satisfied, skipping upgrade: Django>=2.2 in /usr/local/lib/python3.8/dist-packages (from django-filter) (4.0.2)
Requirement already satisfied, skipping upgrade: asgiref<4,>=3.4.1 in /usr/local/lib/python3.8/dist-packages (from Django>=2.2->django-filter) (3.5.0)
Requirement already satisfied, skipping upgrade: sqlparse>=0.2.2 in /usr/local/lib/python3.8/dist-packages (from Django>=2.2->django-filter) (0.4.2)
Requirement already satisfied, skipping upgrade: backports.zoneinfo; python_version < "3.9" in /usr/local/lib/python3.8/dist-packages (from Django>=2.2->django-filter) (0.2.1)
Installing collected packages: django-filter
Successfully installed django-filter-21.1
```

```
user@box:~$ sudo pip3 install -U markdown
/usr/local/lib/python3.8/dist-packages/pkg_resources/__init__.py:122: PkgResourcesDeprecationWarning: 0.23ubuntu1 is an invalid version and will not be supported in a future release
  warnings.warn(
/usr/local/lib/python3.8/dist-packages/pkg_resources/__init__.py:122: PkgResourcesDeprecationWarning: 0.1.36ubuntu1 is an invalid version and will not be supported in a future release
  warnings.warn(
Collecting markdown
  WARNING: Retrying (Retry(total=4, connect=None, read=None, redirect=None, status=None)) after connection broken by 'NewConnectionError('<urllib3.connection.VerifiedHTTPSConnection object at 0x7f36ce64c070>: Failed to establish a new connection: [Errno 101] Network is unreachable')': /packages/9f/d4/2c7f83915d437736996b2674300c6c4b578a6f897f34e40f5c04db146719/Markdown-3.3.6-py3-none-any.whl
  Downloading Markdown-3.3.6-py3-none-any.whl (97 kB)
    |████████████████████████████████████████| 97 kB 273 kB/s
Collecting importlib-metadata>=4.4; python_version < "3.10"
  Downloading importlib_metadata-4.11.1-py3-none-any.whl (17 kB)
Collecting zipp>=0.5
  Downloading zipp-3.7.0-py3-none-any.whl (5.3 kB)
Installing collected packages: zipp, importlib-metadata, markdown
```

```
user@box:~$ sudo pip3 install -U requests
Collecting requests
  Downloading requests-2.27.1-py2.py3-none-any.whl (63 kB)
    |████████████████████████████████████████| 63 kB 118 kB/s
Requirement already satisfied, skipping upgrade: urllib3<1.27,>=1.21.1 in /usr/lib/python3/dist-packages (from requests) (1.25.8)
Requirement already satisfied, skipping upgrade: certifi>=2017.4.17 in /usr/lib/python3/dist-packages (from requests) (2019.11.28)
/usr/local/lib/python3.8/dist-packages/pkg_resources/__init__.py:122: PkgResourcesDeprecationWarning: 0.23ubuntu1 is an invalid version and will not be supported in a future release
  warnings.warn(
/usr/local/lib/python3.8/dist-packages/pkg_resources/__init__.py:122: PkgResourcesDeprecationWarning: 0.1.36ubuntu1 is an invalid version and will not be supported in a future release
  warnings.warn(
Collecting charset-normalizer~=2.0.0; python_version >= "3"
  Downloading charset_normalizer-2.0.12-py3-none-any.whl (39 kB)
Requirement already satisfied, skipping upgrade: idna<4,>=2.5; python_version >= "3" in /usr/lib/python3/dist-packages (from requests) (2.8)
Installing collected packages: charset-normalizer, requests
  Attempting uninstall: requests
    Found existing installation: requests 2.22.0
```

```
user@box:~$ sudo apt install mariadb-server mariadb-client
[sudo] password for user:
Reading package lists... Done
Building dependency tree
Reading state information... Done
mariadb-client is already the newest version (1:10.3.32-0ubuntu0.20.04.1).
mariadb-server is already the newest version (1:10.3.32-0ubuntu0.20.04.1).
The following packages were automatically installed and are no longer required:
  libllvm9 linux-headers-5.4.0-26 linux-headers-5.4.0-26-generic
  linux-image-5.4.0-26-generic linux-modules-5.4.0-26-generic
  linux-modules-extra-5.4.0-26-generic
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
user@box:~$ sudo apt install python3-mysqldb
Reading package lists... Done
Building dependency tree
Reading state information... Done
python3-mysqldb is already the newest version (1.4.4-2build1).
The following packages were automatically installed and are no longer required:
  libllvm9 linux-headers-5.4.0-26 linux-headers-5.4.0-26-generic
  linux-image-5.4.0-26-generic linux-modules-5.4.0-26-generic
```

```
user@box:~$ sudo mysql_secure_installation
```

NOTE: RUNNING ALL PARTS OF THIS SCRIPT IS RECOMMENDED FOR ALL MariaDB  
SERVERS IN PRODUCTION USE! PLEASE READ EACH STEP CAREFULLY!

In order to log into MariaDB to secure it, we'll need the current  
password for the root user. If you've just installed MariaDB, and  
you haven't set the root password yet, the password will be blank,  
so you should just press enter here.

Enter current password for root (enter for none):  
OK, successfully used password, moving on...

Setting the root password ensures that nobody can log into the MariaDB  
root user without the proper authorisation.

You already have a root password set, so you can safely answer 'n'.

Change the root password? [Y/n] n  
... skipping.

By default, a MariaDB installation has an anonymous user, allowing anyone  
to log into MariaDB without having to have a user account created for

By default, a MariaDB installation has an anonymous user, allowing anyone  
to log into MariaDB without having to have a user account created for  
them. This is intended only for testing, and to make the installation  
go a bit smoother. You should remove them before moving into a  
production environment.

Remove anonymous users? [Y/n] y  
... Success!

Normally, root should only be allowed to connect from 'localhost'. This  
ensures that someone cannot guess at the root password from the network.

Disallow root login remotely? [Y/n] y  
... Success!

By default, MariaDB comes with a database named 'test' that anyone can  
access. This is also intended only for testing, and should be removed  
before moving into a production environment.

Remove test database and access to it? [Y/n] y  
- Dropping test database...  
... Success!  
- Removing privileges on test database...  
... Success!

Reloading the privilege tables will ensure that all changes made so far  
will take effect immediately.

Reload privilege tables now? [Y/n] y  
... Success!

Cleaning up...

```
user@box:~$ django-admin startproject stevens
user@box:~$ cd stevens/
user@box:~/stevens$ ls
manage.py  stevens
user@box:~/stevens$ python3 manage.py startapp myapp
user@box:~/stevens$ ls
manage.py  myapp  stevens
user@box:~/stevens$ sudo mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 37
Server version: 10.3.32-MariaDB-0ubuntu0.20.04.1 Ubuntu 20.04

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement
.

MariaDB [(none)]> use mysql
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A
```

### Database changed

```
MariaDB [mysql]> select user, host from mysql.user;
```

```
+-----+-----+
| user | host      |
+-----+-----+
| root | localhost |
+-----+-----+
```

1 row in set (0.013 sec)

```
MariaDB [mysql]> create user pi@localhost identified by 'PASSWORD';
Query OK, 0 rows affected (0.006 sec)
```



```
Query OK, 0 rows affected (0.000 sec)
```

```
MariaDB [mysql]> show databases;
```

```
+-----+
| Database                |
+-----+
| information_schema      |
| mysql                   |
| performance_schema     |
+-----+
```

```
3 rows in set (0.001 sec)
```

```
MariaDB [mysql]> create database stevens;
```

```
Query OK, 1 row affected (0.000 sec)
```

```
MariaDB [mysql]> grant all privileges on stevens.* to pi@localhost;
```

```
Query OK, 0 rows affected (0.000 sec)
```

```
MariaDB [mysql]> quit
```

```
Bye
```

```
user@box:~/stevens$ edit settings.py
```

```
user@box:~/stevens$ cd myapp/
```

```
user@box:~/stevens/myapp$ ls
```

```
admin.py  apps.py  __init__.py  migrations  models.py  tests.py  views.py
```

```
user@box:~/stevens/myapp$ cp ~/iot/lesson4/stevens/admin.py . && cp ~/iot/lesson4/stevens/mode
```

```
ls.py . && cp ~/iot/lesson4/stevens/views.py .
```

```
user@box:~/stevens/myapp$ ls
```

```
admin.py  apps.py  __init__.py  migrations  models.py  tests.py  views.py
```

```
user@box:~/stevens/myapp$ mkdir static templates
```

```
user@box:~/stevens/myapp$ cd templates/
```

```
user@box:~/stevens/myapp/templates$ mkdir myapp
```

```
user@box:~/stevens/myapp/templates$ cd myapp/
```

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

## # Application definition

```
INSTALLED_APPS = [
    'django.contrib.admin',
    'django.contrib.auth',
    'django.contrib.contenttypes',
    'django.contrib.sessions',
    'django.contrib.messages',
    'django.contrib.staticfiles',
    'myapp',

```

```
]■
```



```
DATABASES = {
    'default': {
        'ENGINE': 'django.db.backends.sqlite3',
        'NAME': BASE_DIR / 'db.sqlite3',
        'ENGINE': 'django.db.backends.mysql',
        'NAME': 'stevens',
        'USER': 'pi',
        'PASSWORD': 'raspberry',
        'HOST': '',
        'PORT': '',
        'OPTIONS': {
            'init_command': "SET sql_mode='STRICT_TRANS_TABLES'",
        },
    }
}
```

```
LANGUAGE_CODE = 'en-us'

TIME_ZONE = 'America/New_York'

USE_I18N = True

USE_TZ = True
```

```
user@box:~/stevens/myapp/templates$ cd myapp
user@box:~/stevens/myapp/templates/myapp$ cp ~/iot/lesson4/stevens/index.html .
user@box:~/stevens/myapp/templates/myapp$ cd ~/stevens/myapp/static
user@box:~/stevens/myapp/static$ cp ~/iot/lesson4/static/favicon.ico .
user@box:~/stevens/myapp/static$ mkdir myapp
user@box:~/stevens/myapp/static$ cd myapp
user@box:~/stevens/myapp/static/myapp$ cp ~/iot/lesson4/static/*css .
user@box:~/stevens/myapp/static/myapp$ cp ~/iot/lesson4/static/*js .
user@box:~/stevens/myapp/static/myapp$ cd ~/stevens
```

## Weather Station

Stevens Institute of Technology

Temperature

42°F



## My CPU

Stevens Institute of Technology

CPU Usage  
7.6%

Memory Available  
3.2 GB



```
user@box:~/iot/lesson4$ python3 hello_world.py
* Serving Flask app 'hello_world' (lazy loading)
* Environment: production
  WARNING: This is a development server. Do not use it in a production deployment.
  Use a production WSGI server instead.
* Debug mode: off
* Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
127.0.0.1 - - [22/Mar/2022 18:53:46] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [22/Mar/2022 18:53:46] "GET /favicon.ico HTTP/1.1" 200 -
```



127.0.0.1:5000

Hello World!