Docker | How to Dockerize a Django application

1 - create a project folder

2 - go to the project from command line

3 - install virtual environment for python with
   'python3 -m venv venv'

4 - activate the virtual environment
   'pipenv shell'

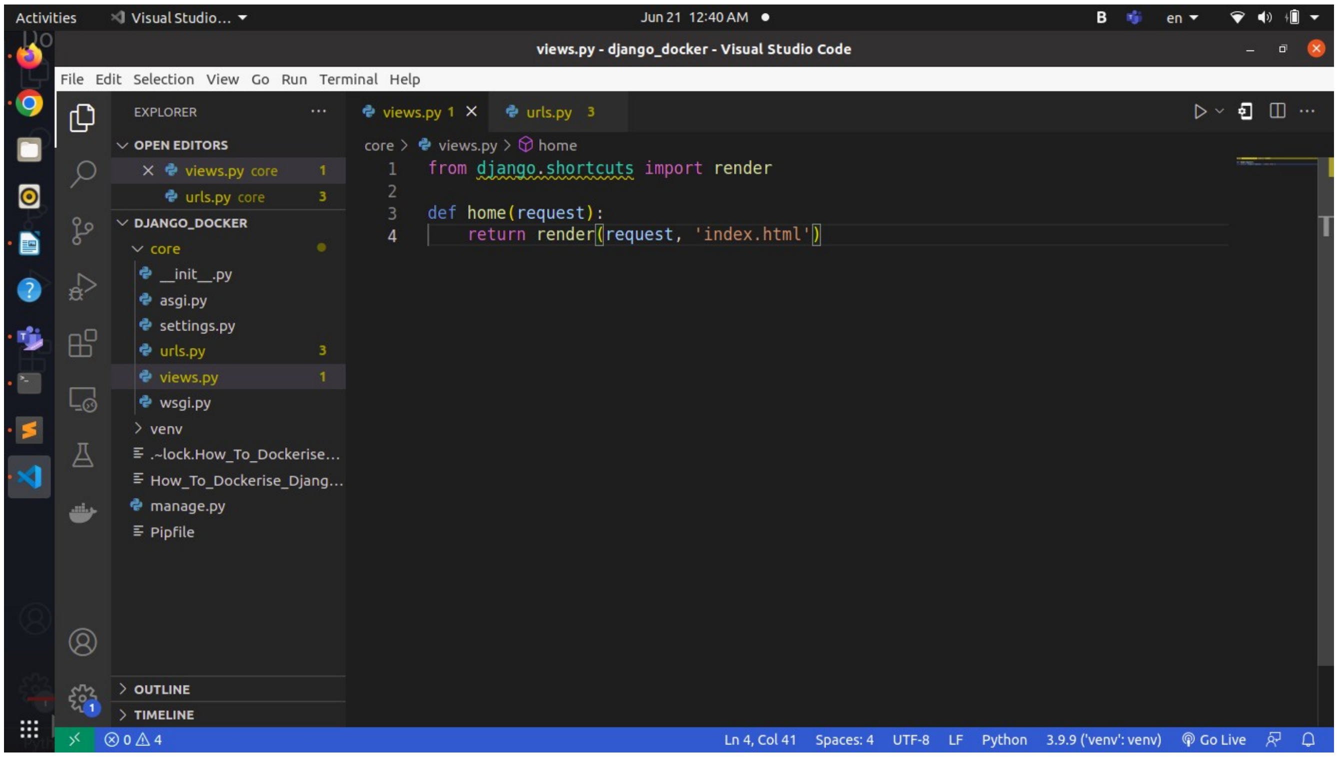
5 - install django with
   'pip install django'

6 - install django admin panel with
   'django-admin startproject core .'

7 – Add new file ‘views.py’ to the ‘cofe’ project folder

```
from django.shortcuts import render

def home(request):
    return render(request, 'index.html')
```



```
from django.shortcuts import render

def home(request):
    return render(request, 'index.html')
```

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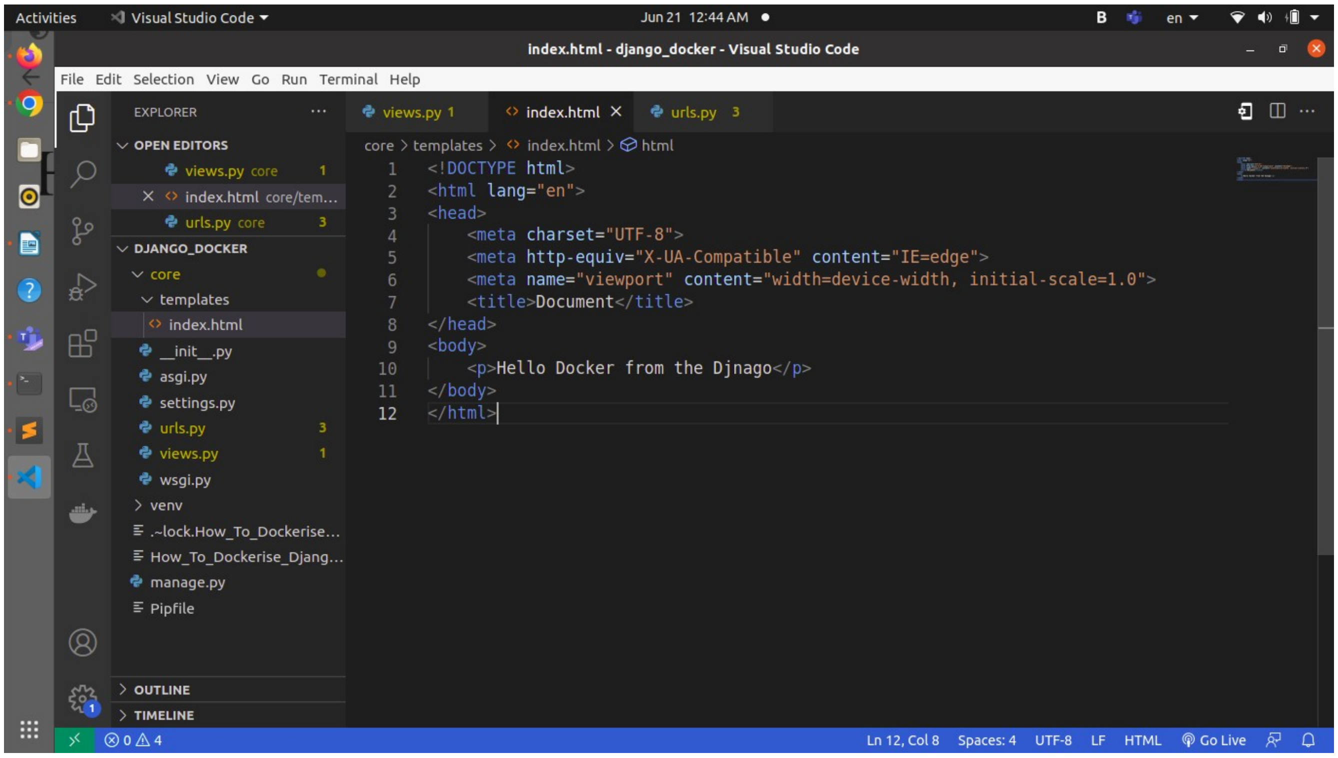
8 – Add new route to the ‘urls.py’

```
from django.contrib import admin
from django.urls import path

from . import views

urlpatterns = [
    path('admin/', admin.site.urls),
    path('', views.home),
]
```

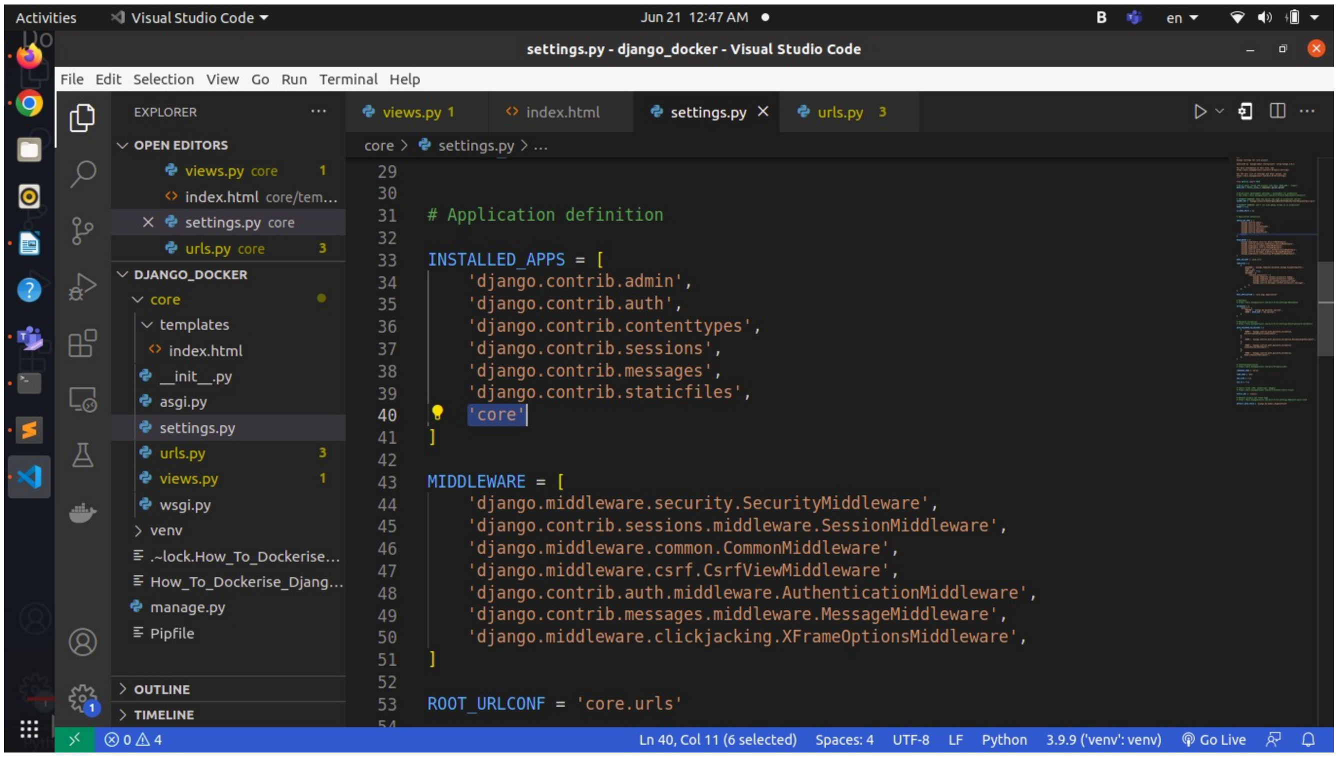
9 – Add new folder ‘**templates** to the ‘**core**’ folder and add new file ‘**index.html**’



index.html - django_docker - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
OPEN EDITORS
views.py core
index.html core/tem...
urls.py core
DJANGO_DOCKER
core
templates
index.html
__init__.py
asgi.py
settings.py
urls.py
views.py
wsgi.py
venv
.~lock.How_To_Dockerise...
How_To_Dockerise_Djang...
manage.py
Pipfile
OUTLINE
TIMELINE
core > templates > index.html > html
Ln 12, Col 8 Spaces: 4 UTF-8 LF HTML Go Live

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>
<body>
    <p>Hello Docker from the Djnago</p>
</body>
</html>
```

10 – Register the project folder ‘**core**’ to ‘**settings.**py’



```python


# Application definition

INSTALLED_APPS = [
    'django.contrib.admin',
    'django.contrib.auth',
    'django.contrib.contenttypes',
    'django.contrib.sessions',
    'django.contrib.messages',
    'django.contrib.staticfiles',
    'core'
]

MIDDLEWARE = [
    'django.middleware.security.SecurityMiddleware',
    'django.contrib.sessions.middleware.SessionMiddleware',
    'django.middleware.common.CommonMiddleware',
    'django.middleware.csrf.CsrfViewMiddleware',
    'django.contrib.auth.middleware.AuthenticationMiddleware',
    'django.contrib.messages.middleware.MessageMiddleware',
    'django.middleware.clickjacking.XFrameOptionsMiddleware',
]

ROOT_URLCONF = 'core.urls'
```

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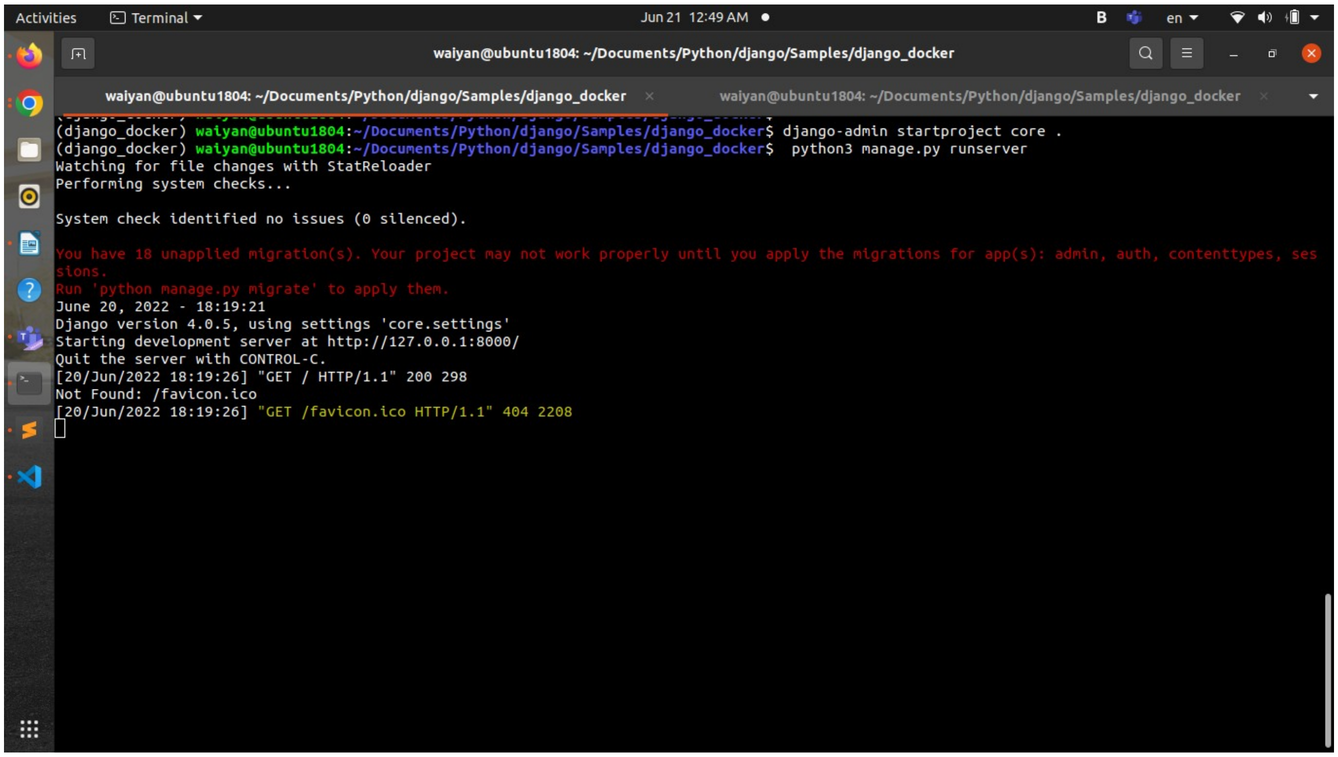
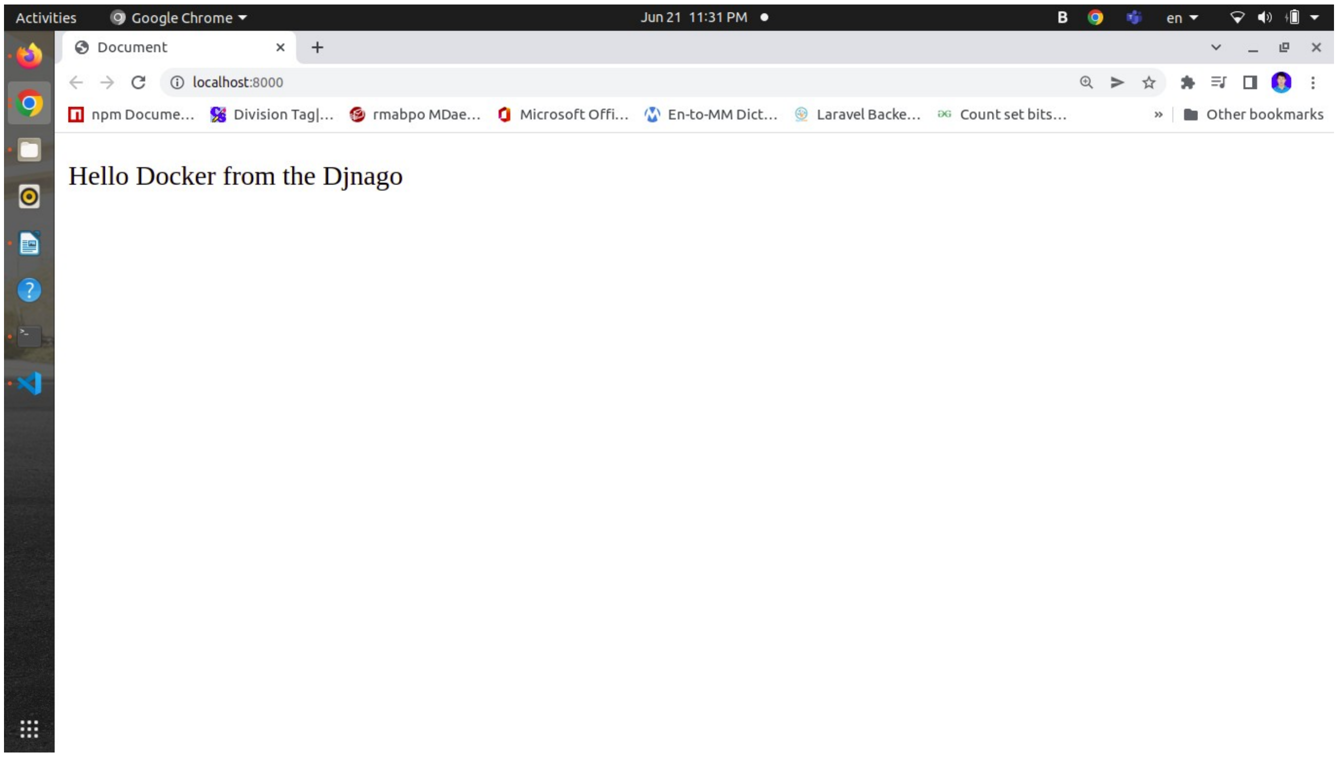
11 – Run the Project with
‘python3 manage.py runserver 127.0.0.1:8000’

12 – It will run at the command line like the following image


Activities
Terminal
Jun 21 12:49 AM
en
waiyan@ubuntu1804: ~/Documents/Python/django/Samples/django_docker
waiyan@ubuntu1804: ~/Documents/Python/django/Samples/django_docker
waiyan@ubuntu1804: ~/Documents/Python/django/Samples/django_docker

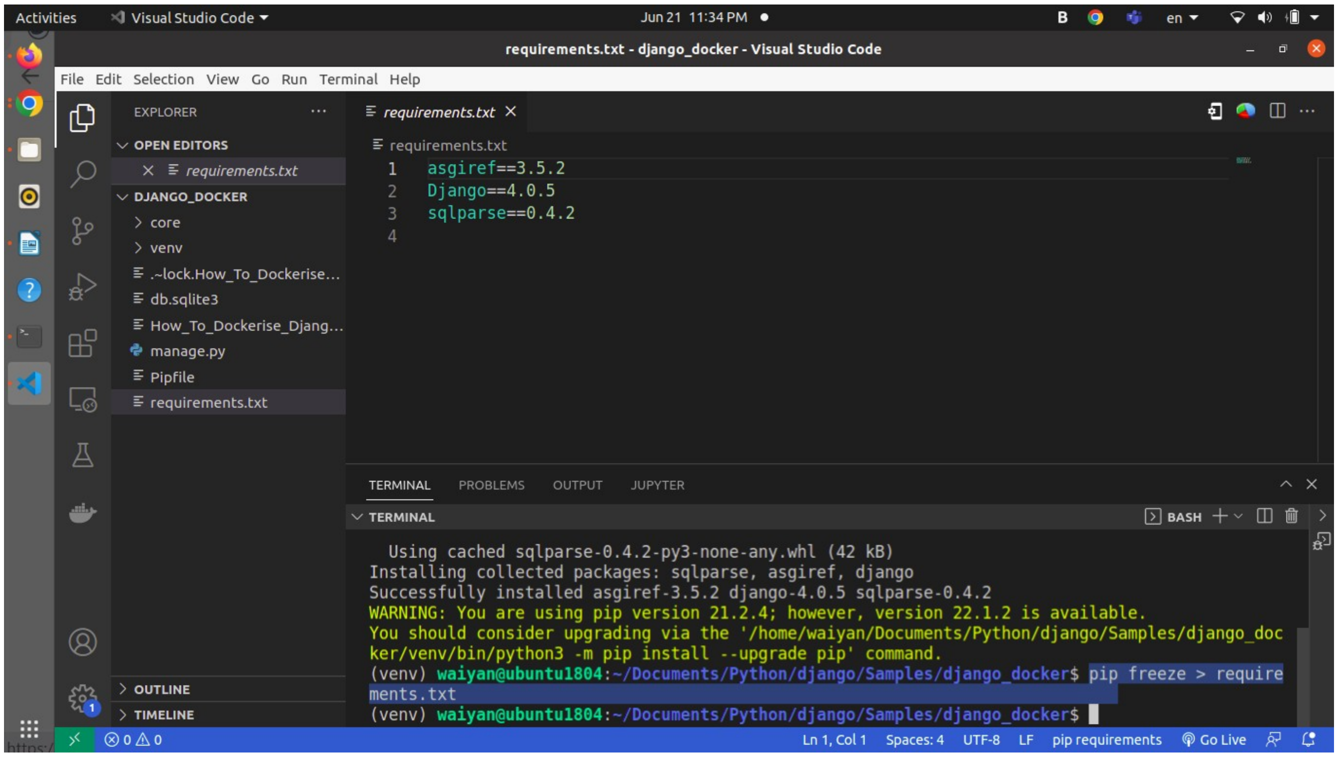
```
(django_docker) waiyan@ubuntu1804:~/Documents/Python/django/Samples/django_docker$ django-admin startproject core .
(django_docker) waiyan@ubuntu1804:~/Documents/Python/django/Samples/django_docker$  python3 manage.py runserver
Watching for file changes with StatReloader
Performing system checks...

System check identified no issues (0 silenced).

You have 18 unapplied migration(s). Your project may not work properly until you apply the migrations for app(s): admin, auth, contenttypes, ses
sions.
Run 'python manage.py migrate' to apply them.
June 20, 2022 - 18:19:21
Django version 4.0.5, using settings 'core.settings'
Starting development server at http://127.0.0.1:8000/
Quit the server with CONTROL-C.
[20/Jun/2022 18:19:26] "GET / HTTP/1.1" 200 298
Not Found: /favicon.ico
[20/Jun/2022 18:19:26] "GET /favicon.ico HTTP/1.1" 404 2208
```

11 – Browse the project with ‘http://127.0.0.1:8000/ ‘and it will tun like the following image



Hello Docker from the Djnago

12 – Prepare Django Package list for the App. Go to the project folder and run the following "pip freeze > requirements.txt" and it will generate " requirements.txt"

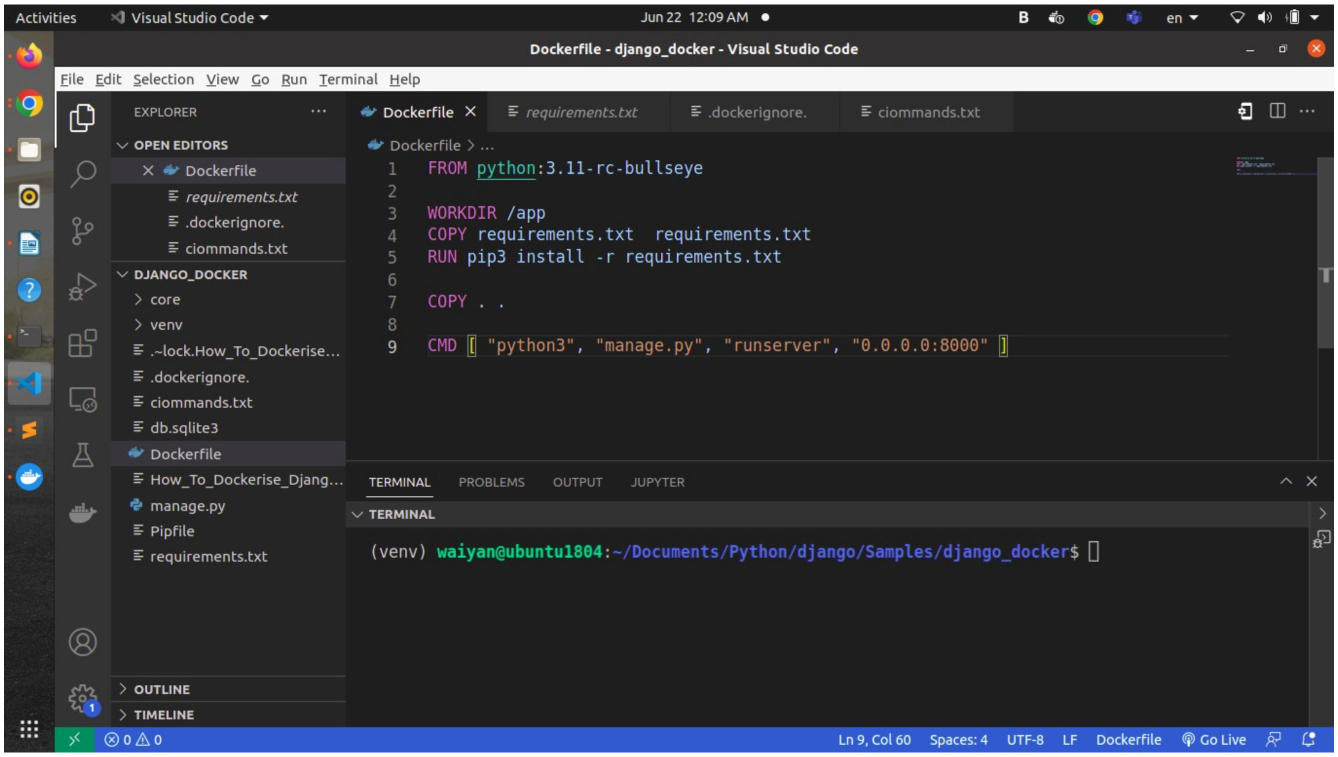


```
asgiref==3.5.2
Django==4.0.5
sqlparse==0.4.2
```

```
  Using cached sqlparse-0.4.2-py3-none-any.whl (42 kB)
Installing collected packages: sqlparse, asgiref, django
Successfully installed asgiref-3.5.2 django-4.0.5 sqlparse-0.4.2
WARNING: You are using pip version 21.2.4; however, version 22.1.2 is available.
You should consider upgrading via the '/home/waiyan/Documents/Python/django/Samples/django_doc
ker/venv/bin/python3 -m pip install --upgrade pip' command.
(venv) waiyan@ubuntu1804:~/Documents/Python/django/Samples/django_docker$ pip freeze > require
ments.txt
(venv) waiyan@ubuntu1804:~/Documents/Python/django/Samples/django_docker$
```

13 – Add docker file "Dockerfile" and docker ignore file ".dockerignore. to the project

```
FROM python:3.11-rc-bullseye

WORKDIR /app
COPY requirements.txt  requirements.txt
RUN pip3 install -r requirements.txt

COPY . .

CMD [ "python3", "manage.py", "runserver", "0.0.0.0:8000" ]
```



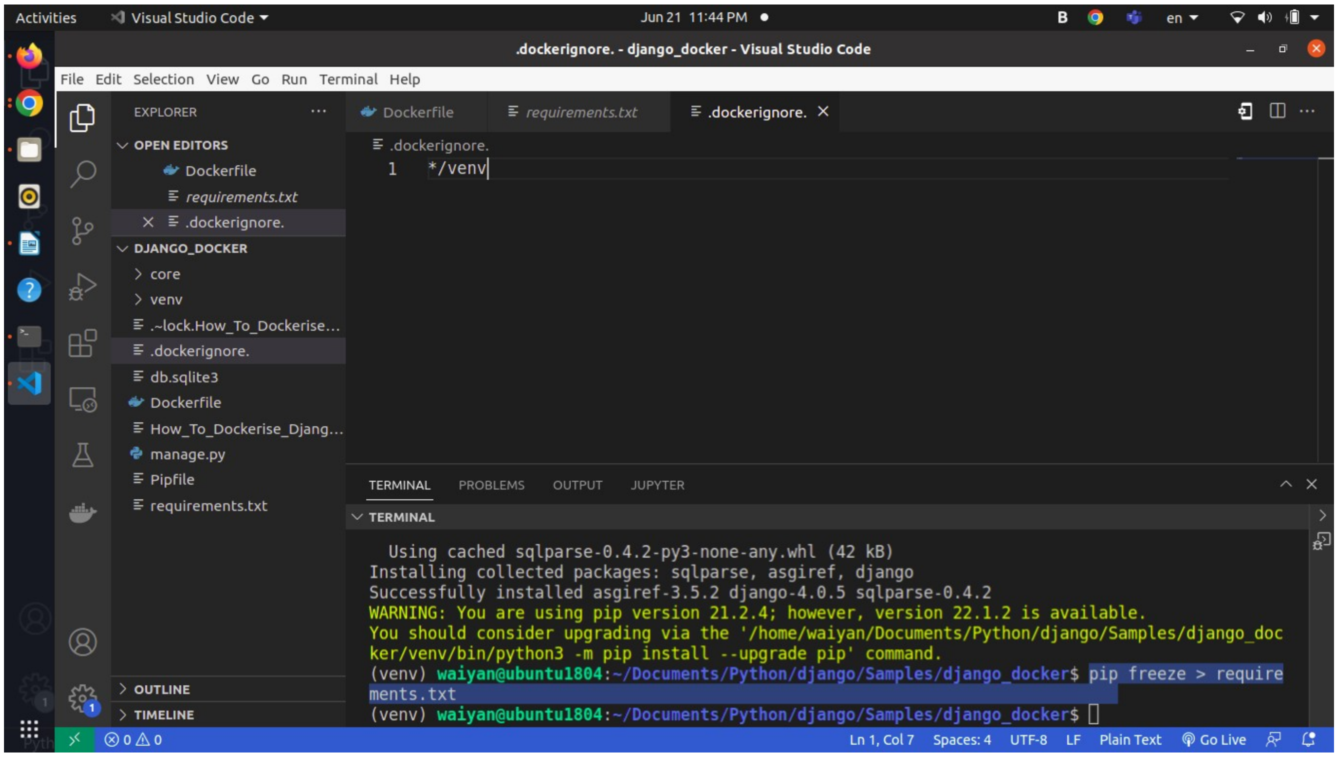
```
FROM python:3.11-rc-bullseye

WORKDIR /app
COPY requirements.txt  requirements.txt
RUN pip3 install -r requirements.txt

COPY . .

CMD [ "python3", "manage.py", "runserver", "0.0.0.0:8000" ]
```

```
(venv) waiyan@ubuntu1804:~/Documents/Python/django/Samples/django_docker$ 
```

.dockerignore.

File name start with dot and end with dot

```
*/venv
```



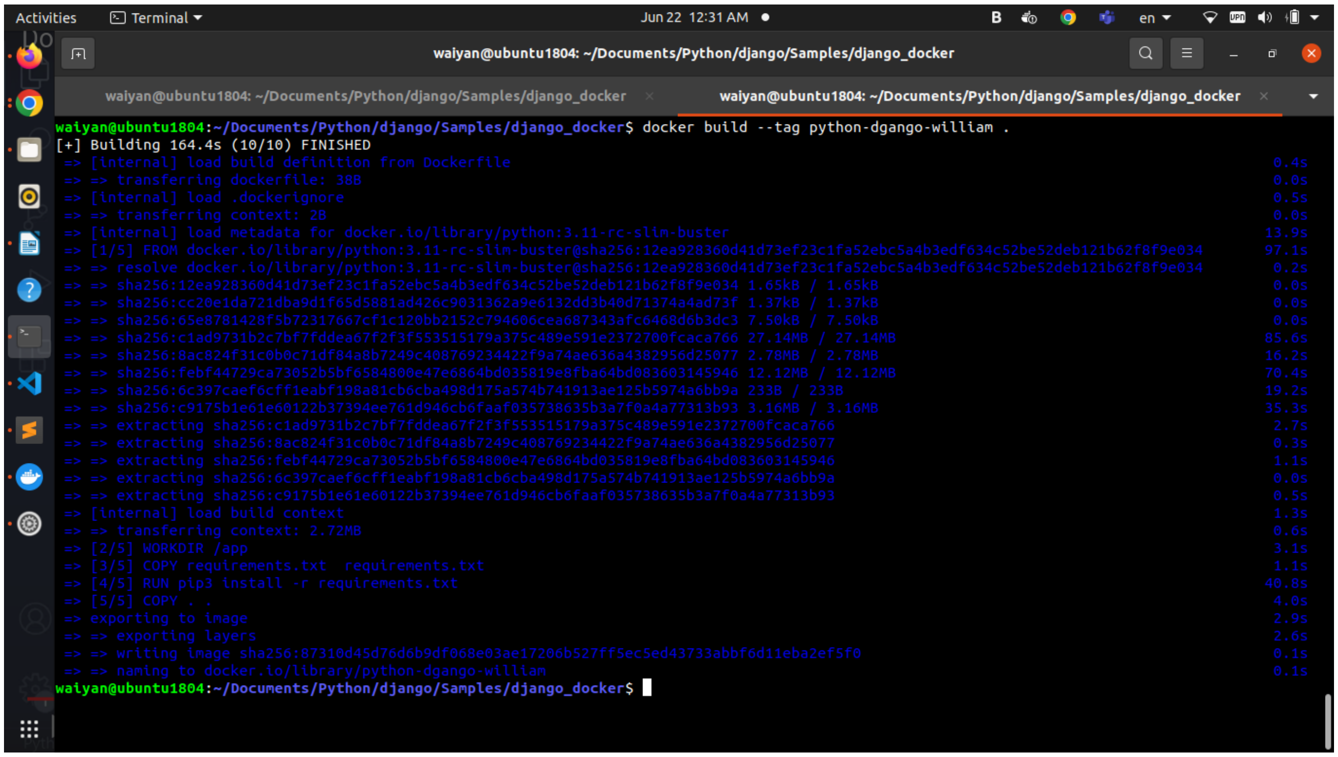
```
*/venv
```

```
  Using cached sqlparse-0.4.2-py3-none-any.whl (42 kB)
Installing collected packages: sqlparse, asgiref, django
Successfully installed asgiref-3.5.2 django-4.0.5 sqlparse-0.4.2
WARNING: You are using pip version 21.2.4; however, version 22.1.2 is available.
You should consider upgrading via the '/home/waiyan/Documents/Python/django/Samples/django_doc
ker/venv/bin/python3 -m pip install --upgrade pip' command.
(venv) waiyan@ubuntu1804:~/Documents/Python/django/Samples/django_docker$ pip freeze > require
ments.txt
(venv) waiyan@ubuntu1804:~/Documents/Python/django/Samples/django_docker$ 
```

14 – Check the Docker Commands to run at the **commmands.txt** file at the project

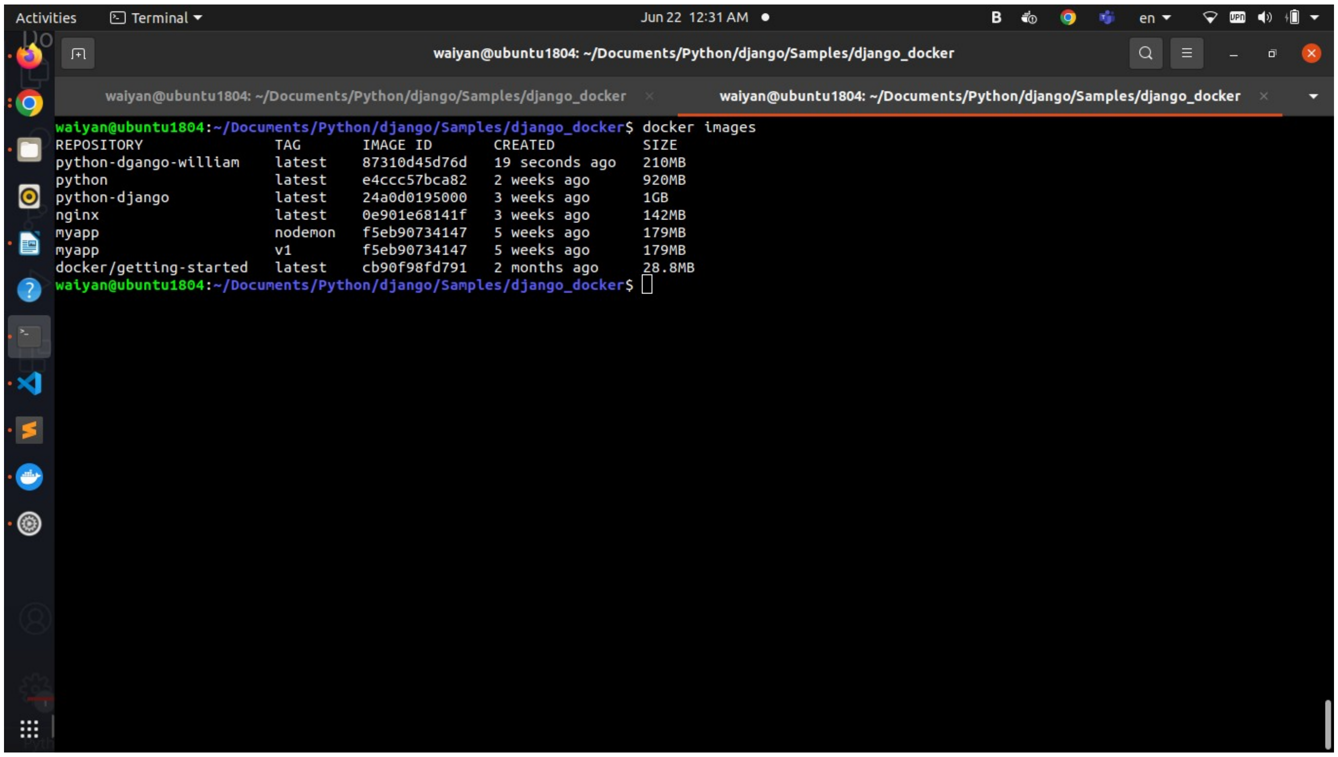
```
docker build --tag python-dgango-william .
docker run --publish 8000:8000 python-dgango-william
```

15 – Create the Docker image with
“**docker build --tag python-dgango-william .** “


Activities
Terminal
Jun 22 12:31 AM
en
waiyan@ubuntu1804: ~/Documents/Python/django/Samples/django_docker
waiyan@ubuntu1804: ~/Documents/Python/django/Samples/django_docker
waiyan@ubuntu1804: ~/Documents/Python/django/Samples/django_docker

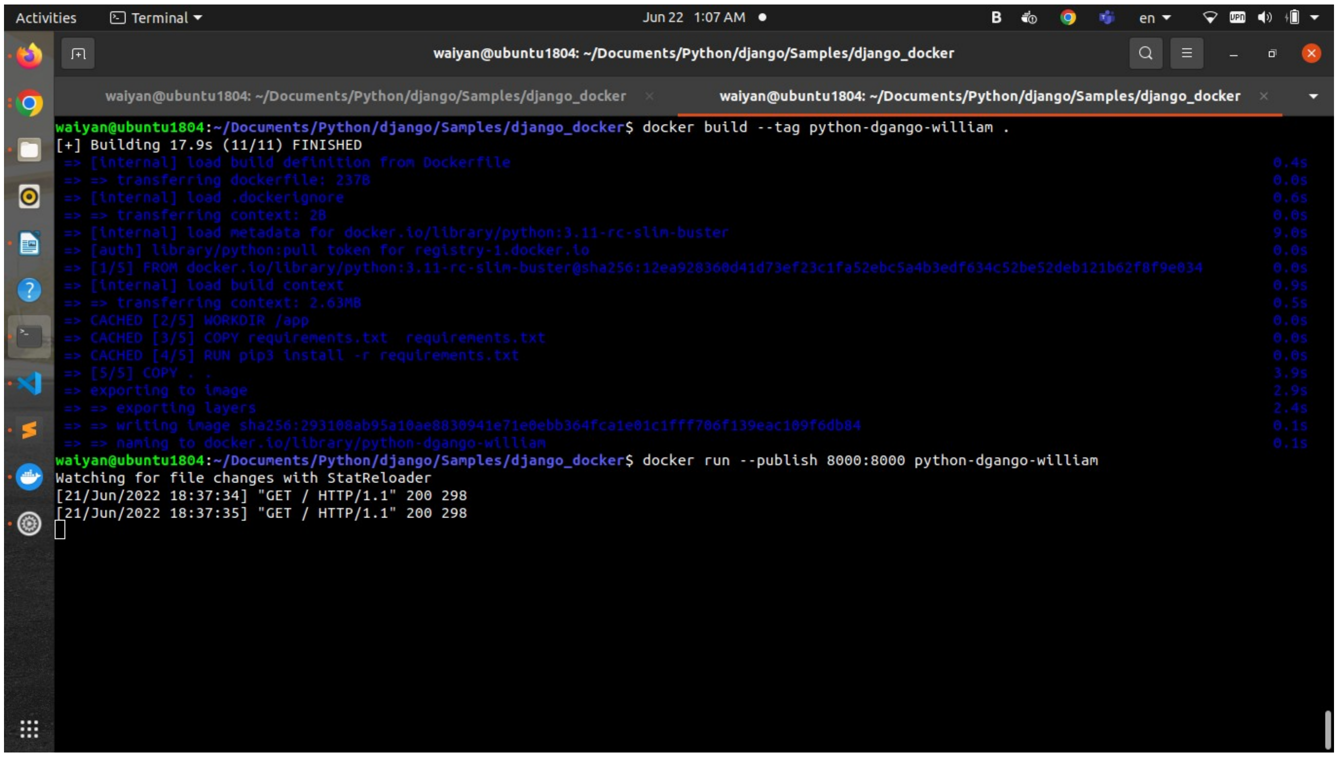
```
waiyan@ubuntu1804:~/Documents/Python/django/Samples/django_docker$ docker build --tag python-dgango-william .
[+] Building 164.4s (10/10) FINISHED
 => [internal] load build definition from Dockerfile                                                                                       0.4s
 => => transferring dockerfile: 38B                                                                                                        0.0s
 => [internal] load .dockerignore                                                                                                          0.5s
 => => transferring context: 2B                                                                                                            0.0s
 => [internal] load metadata for docker.io/library/python:3.11-rc-slim-buster                                                             13.9s
 => [1/5] FROM docker.io/library/python:3.11-rc-slim-buster@sha256:12ea928360d41d73ef23c1fa52ebc5a4b3edf634c52be52deb121b62f8f9e034       97.1s
 => => resolve docker.io/library/python:3.11-rc-slim-buster@sha256:12ea928360d41d73ef23c1fa52ebc5a4b3edf634c52be52deb121b62f8f9e034        0.2s
 => => sha256:12ea928360d41d73ef23c1fa52ebc5a4b3edf634c52be52deb121b62f8f9e034 1.65kB / 1.65kB                                             0.0s
 => => sha256:cc20e1da721dba9d1f65d5881ad426c9031362a9e6132dd3b40d71374a4ad73f 1.37kB / 1.37kB                                             0.0s
 => => sha256:65e8781428f5b72317667cf1c120bb2152c794606cea687343afc6468d6b3dc3 7.50kB / 7.50kB                                             0.0s
 => => sha256:c1ad9731b2c7bf7fddea67f2f3f553515179a375c489e591e2372700fcaca766 27.14MB / 27.14MB                                          85.6s
 => => sha256:8ac824f31c0b0c71df84a8b7249c408769234422f9a74ae636a4382956d25077 2.78MB / 2.78MB                                            16.2s
 => => sha256:febf44729ca73052b5bf6584800e47e6864bd035819e8fba64bd083603145946 12.12MB / 12.12MB                                          70.4s
 => => sha256:6c397caef6cff1eabf198a81cb6cba498d175a574b741913ae125b5974a6bb9a 233B / 233B                                                19.2s
 => => sha256:c9175b1e61e60122b37394ee761d946cb6faaf035738635b3a7f0a4a77313b93 3.16MB / 3.16MB                                            35.3s
 => => extracting sha256:c1ad9731b2c7bf7fddea67f2f3f553515179a375c489e591e2372700fcaca766                                                  2.7s
 => => extracting sha256:8ac824f31c0b0c71df84a8b7249c408769234422f9a74ae636a4382956d25077                                                  0.3s
 => => extracting sha256:febf44729ca73052b5bf6584800e47e6864bd035819e8fba64bd083603145946                                                  1.1s
 => => extracting sha256:6c397caef6cff1eabf198a81cb6cba498d175a574b741913ae125b5974a6bb9a                                                  0.0s
 => => extracting sha256:c9175b1e61e60122b37394ee761d946cb6faaf035738635b3a7f0a4a77313b93                                                  0.5s
 => [internal] load build context                                                                                                          1.3s
 => => transferring context: 2.72MB                                                                                                        0.6s
 => [2/5] WORKDIR /app                                                                                                                     3.1s
 => [3/5] COPY requirements.txt  requirements.txt                                                                                          1.1s
 => [4/5] RUN pip3 install -r requirements.txt                                                                                            40.8s
 => [5/5] COPY . .                                                                                                                         4.0s
 => exporting to image                                                                                                                     2.9s
 => => exporting layers                                                                                                                    2.6s
 => => writing image sha256:87310d45d76d6b9df068e03ae17206b527ff5ec5ed43733abbf6d11eba2ef5f0                                               0.1s
 => => naming to docker.io/library/python-dgango-william                                                                                   0.1s
waiyan@ubuntu1804:~/Documents/Python/django/Samples/django_docker$ 
```

16 – Check the Docker image at Docker Desktop or at command line
“**docker images** “


Activities
Terminal
Jun 22 12:31 AM
waiyan@ubuntu1804: ~/Documents/Python/django/Samples/django_docker

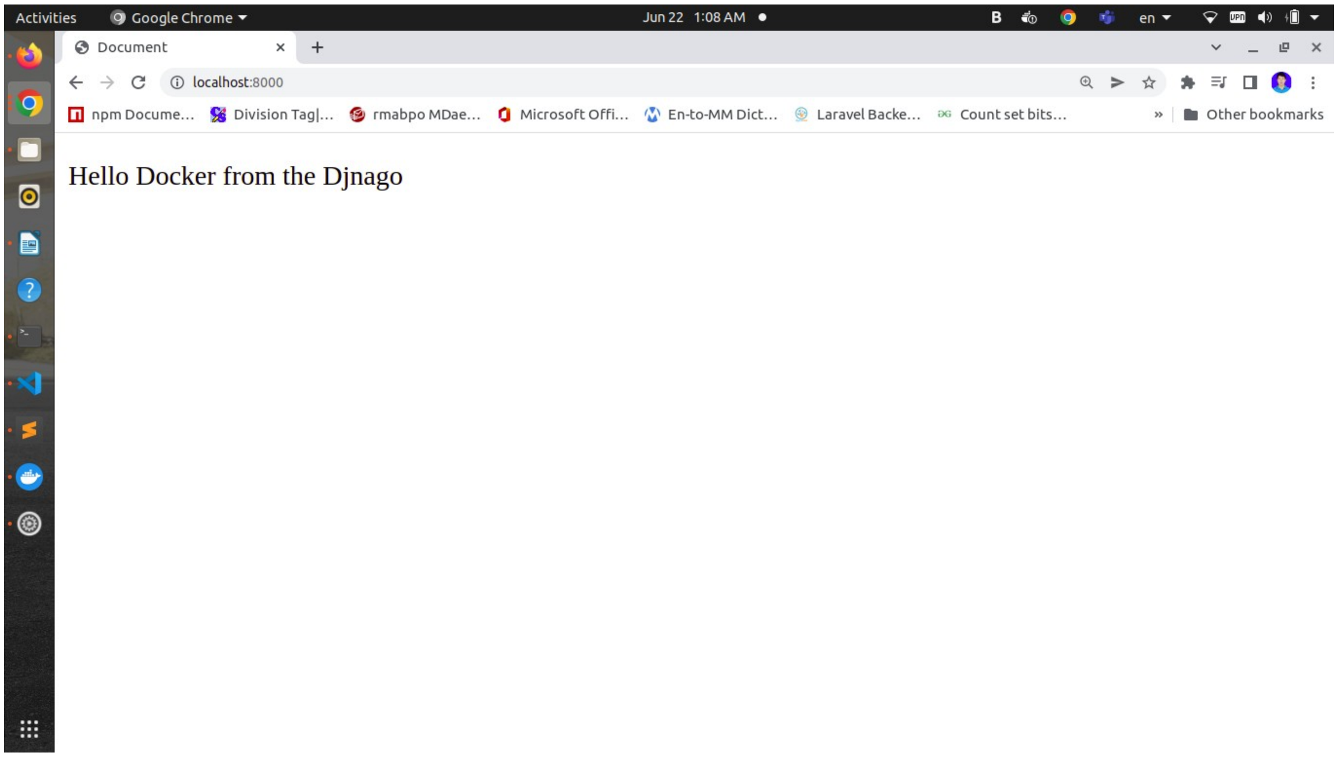
```
waiyan@ubuntu1804:~/Documents/Python/django/Samples/django_docker$ docker images
REPOSITORY               TAG       IMAGE ID       CREATED          SIZE
python-dgango-william    latest    87310d45d76d   19 seconds ago   210MB
python                   latest    e4ccc57bca82   2 weeks ago      920MB
python-django            latest    24a0d0195000   3 weeks ago      1GB
nginx                    latest    0e901e68141f   3 weeks ago      142MB
myapp                    nodemon   f5eb90734147   5 weeks ago      179MB
myapp                    v1        f5eb90734147   5 weeks ago      179MB
docker/getting-started   latest    cb90f98fd791   2 months ago     28.8MB
waiyan@ubuntu1804:~/Documents/Python/django/Samples/django_docker$ 
```

17 – run the docker image (Create the docker container) with
“**docker run --publish 8000:8000 python-dgango-william**“
and check the result at the browser with “**http://localhost:8000/**”



Activities
Terminal
Jun 22 1:07 AM
en
waiyan@ubuntu1804: ~/Documents/Python/django/Samples/django_docker
waiyan@ubuntu1804: ~/Documents/Python/django/Samples/django_docker
waiyan@ubuntu1804: ~/Documents/Python/django/Samples/django_docker

```
waiyan@ubuntu1804:~/Documents/Python/django/Samples/django_docker$ docker build --tag python-dgango-william .
[+] Building 17.9s (11/11) FINISHED
 => [internal] load build definition from Dockerfile                                                                                       0.4s
 => => transferring dockerfile: 237B                                                                                                       0.0s
 => [internal] load .dockerignore                                                                                                          0.6s
 => => transferring context: 2B                                                                                                            0.0s
 => [internal] load metadata for docker.io/library/python:3.11-rc-slim-buster                                                              9.0s
 => [auth] library/python:pull token for registry-1.docker.io                                                                              0.0s
 => [1/5] FROM docker.io/library/python:3.11-rc-slim-buster@sha256:12ea928360d41d73ef23c1fa52ebc5a4b3edf634c52be52deb121b62f8f9e034        0.0s
 => [internal] load build context                                                                                                          0.9s
 => => transferring context: 2.63MB                                                                                                        0.5s
 => CACHED [2/5] WORKDIR /app                                                                                                              0.0s
 => CACHED [3/5] COPY requirements.txt  requirements.txt                                                                                   0.0s
 => CACHED [4/5] RUN pip3 install -r requirements.txt                                                                                      0.0s
 => [5/5] COPY . .                                                                                                                         3.9s
 => exporting to image                                                                                                                     2.9s
 => => exporting layers                                                                                                                    2.4s
 => => writing image sha256:293108ab95a10ae8830941e71e0ebb364fca1e01c1fff706f139eac109f6db84                                               0.1s
 => => naming to docker.io/library/python-dgango-william                                                                                   0.1s
waiyan@ubuntu1804:~/Documents/Python/django/Samples/django_docker$ docker run --publish 8000:8000 python-dgango-william
Watching for file changes with StatReloader
[21/Jun/2022 18:37:34] "GET / HTTP/1.1" 200 298
[21/Jun/2022 18:37:35] "GET / HTTP/1.1" 200 298
```



```
Hello Docker from the Djnago
```