RECAP

Topics Covered:

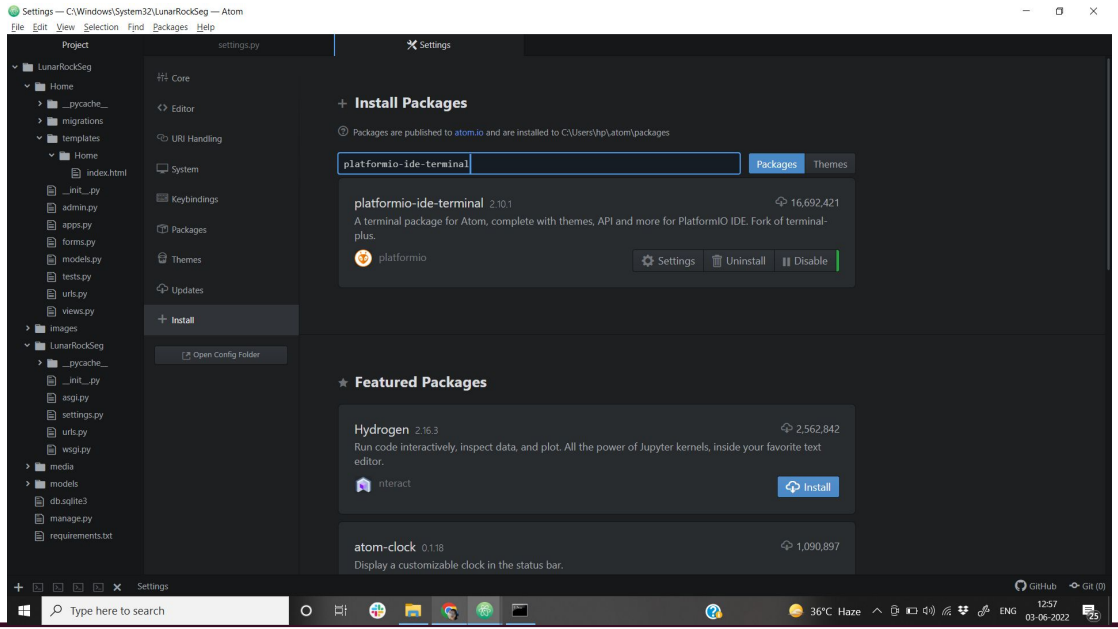
- ML Pipeline to segment Lunar Dataset Images
- Advanced ML Pipeline with segmentation_models and callbacks
- Best practices for image segmentation

Today we will learn

- Creating a Django Project and **Deploying** our trained model in it!

Install Atom and platformio-ide-terminal

- After installing Atom, go to File > Settings > Install > type: platformio-ide-terminal



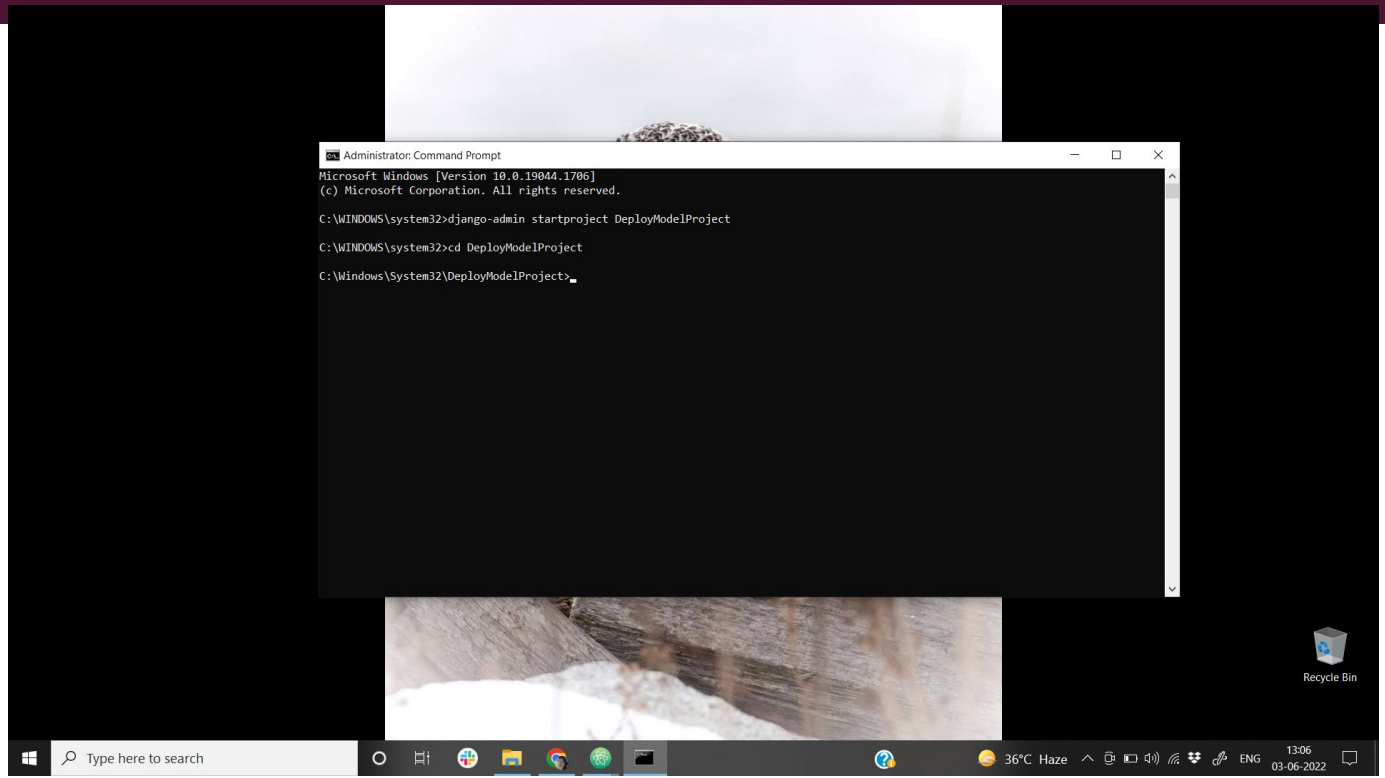
Install DJANGO

- Open CMD as administrator
- `pip install django`

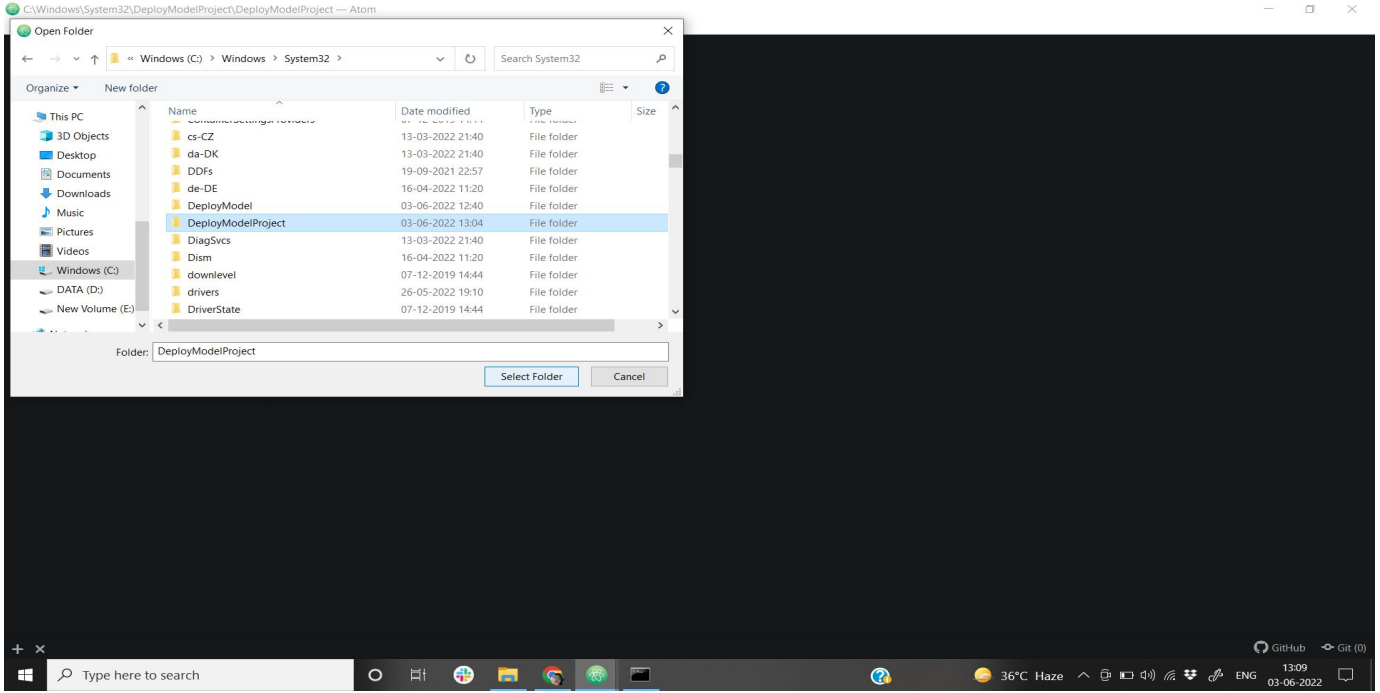
Start a new django project

- In the CMD as administrator window, type:
  - django-admin startproject DeployModelProject
  - cd DeployModelProject

Start Django Project



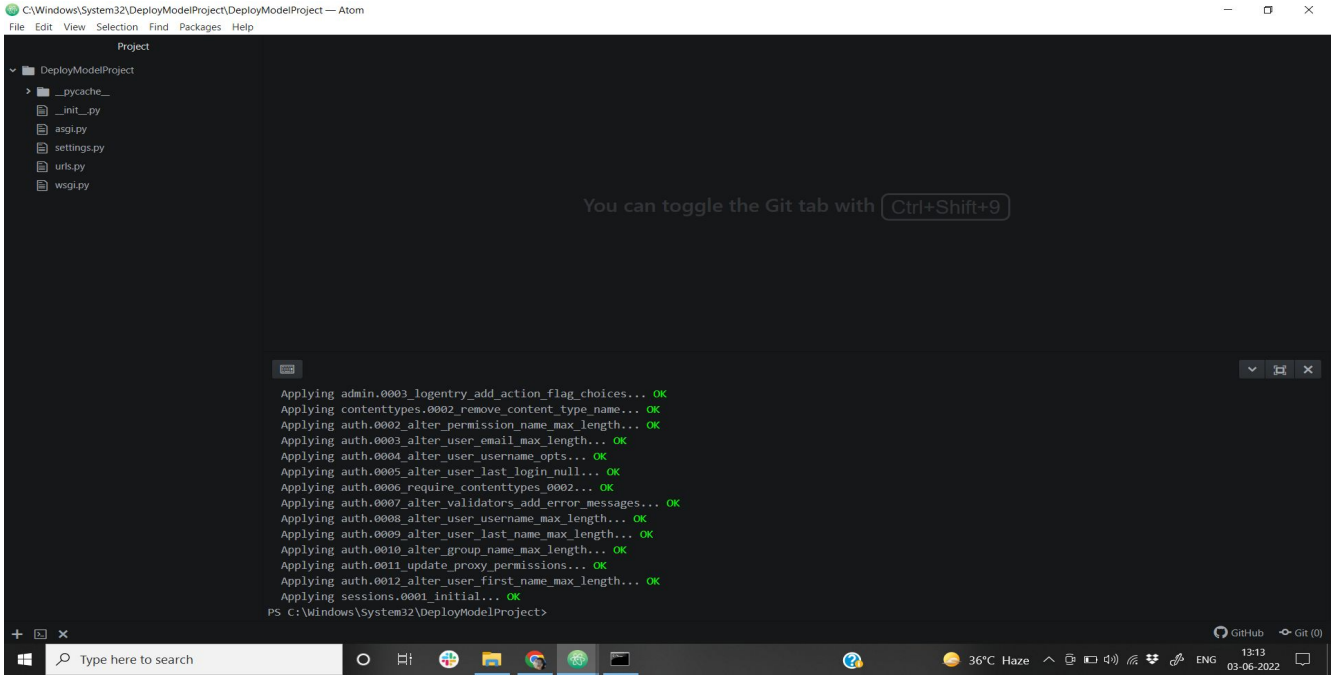
Open Project in Atom - Fire up Atom as administrator



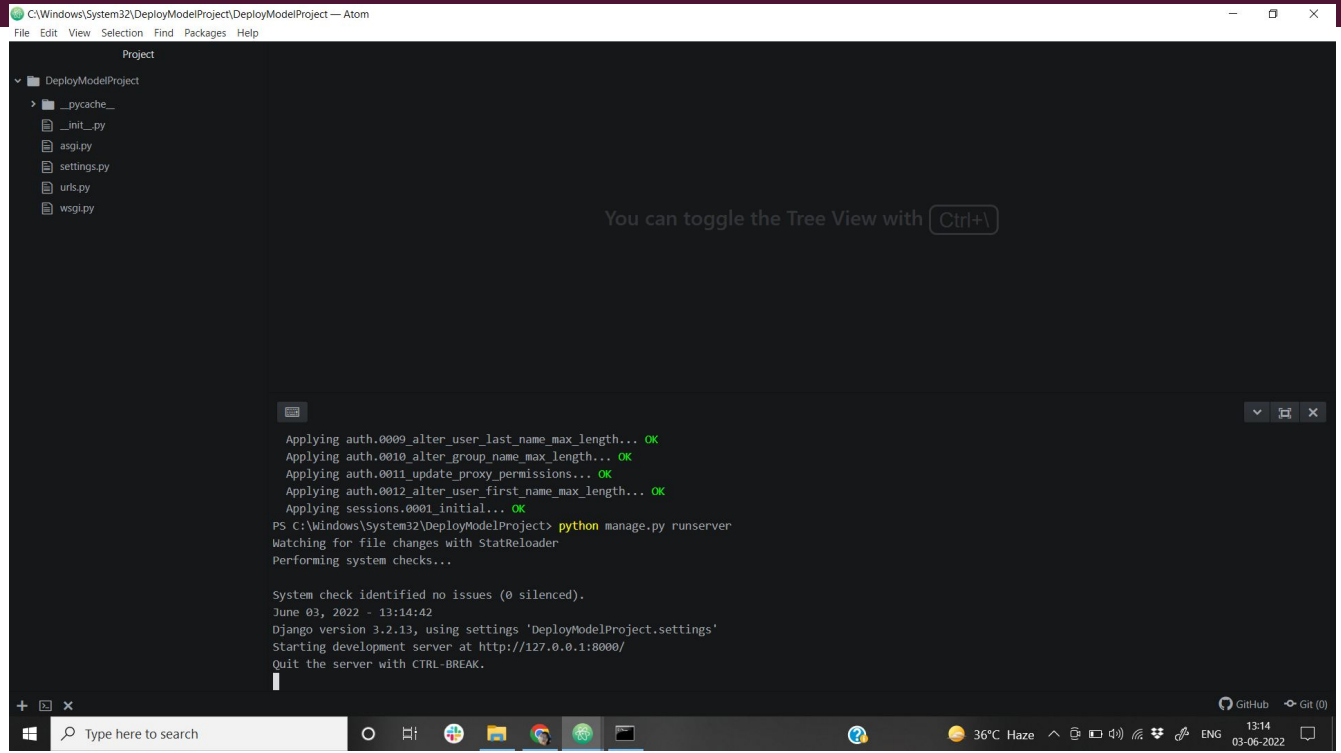
First Run

- **python manage.py migrate**
- **python manage.py runserver**

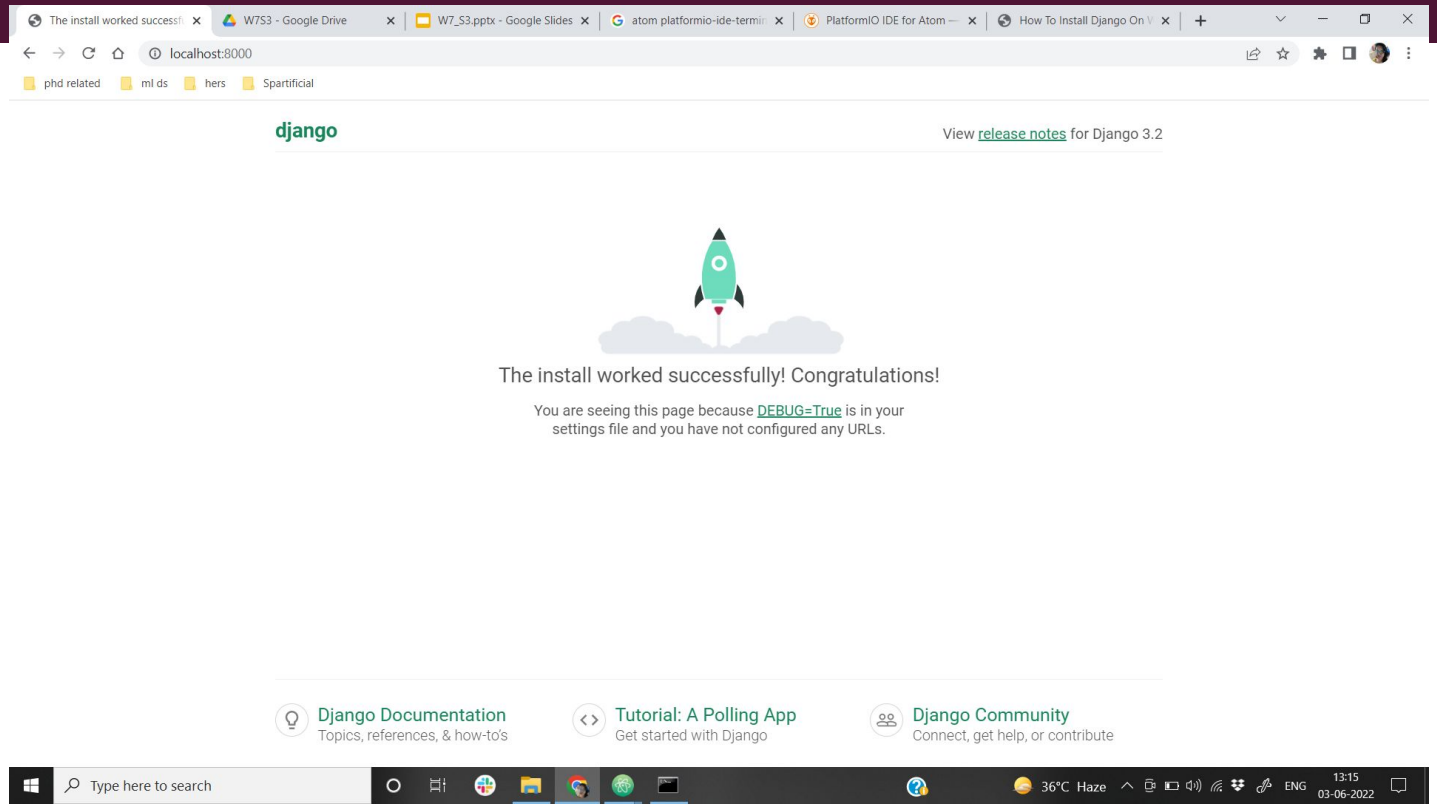
First Run


C:\Windows\System32\DeployModelProject\DeployModelProject — Atom
File Edit View Selection Find Packages Help
Project
DeployModelProject
__pycache__
__init__.py
asgi.py
settings.py
urls.py
wsgi.py
You can toggle the Git tab with Ctrl+Shift+9
Applying admin.0003_logentry_add_action_flag_choices... OK
Applying contenttypes.0002_remove_content_type_name... OK
Applying auth.0002_alter_permission_name_max_length... OK
Applying auth.0003_alter_user_email_max_length... OK
Applying auth.0004_alter_user_username_opts... OK
Applying auth.0005_alter_user_last_login_null... OK
Applying auth.0006_require_contenttypes_0002... OK
Applying auth.0007_alter_validators_add_error_messages... OK
Applying auth.0008_alter_user_username_max_length... OK
Applying auth.0009_alter_user_last_name_max_length... OK
Applying auth.0010_alter_group_name_max_length... OK
Applying auth.0011_update_proxy_permissions... OK
Applying auth.0012_alter_user_first_name_max_length... OK
Applying sessions.0001_initial... OK
PS C:\Windows\System32\DeployModelProject>
GitHub
Git (0)
Type here to search
36°C Haze
ENG
13:13
03-06-2022

First Run


C:\Windows\System32\DeployModelProject\DeployModelProject — Atom
File Edit View Selection Find Packages Help
Project
DeployModelProject
__pycache__
__init__.py
asgi.py
settings.py
urls.py
wsgi.py
You can toggle the Tree View with Ctrl+\
Applying auth.0009_alter_user_last_name_max_length... OK
Applying auth.0010_alter_group_name_max_length... OK
Applying auth.0011_update_proxy_permissions... OK
Applying auth.0012_alter_user_first_name_max_length... OK
Applying sessions.0001_initial... OK
PS C:\Windows\System32\DeployModelProject> python manage.py runserver
Watching for file changes with StatReloader
Performing system checks...
System check identified no issues (0 silenced).
June 03, 2022 - 13:14:42
Django version 3.2.13, using settings 'DeployModelProject.settings'
Starting development server at http://127.0.0.1:8000/
Quit the server with CTRL-BREAK.
GitHub
Git (0)
Type here to search
36°C Haze
ENG
13:14
03-06-2022

First Run - open localhost:8000



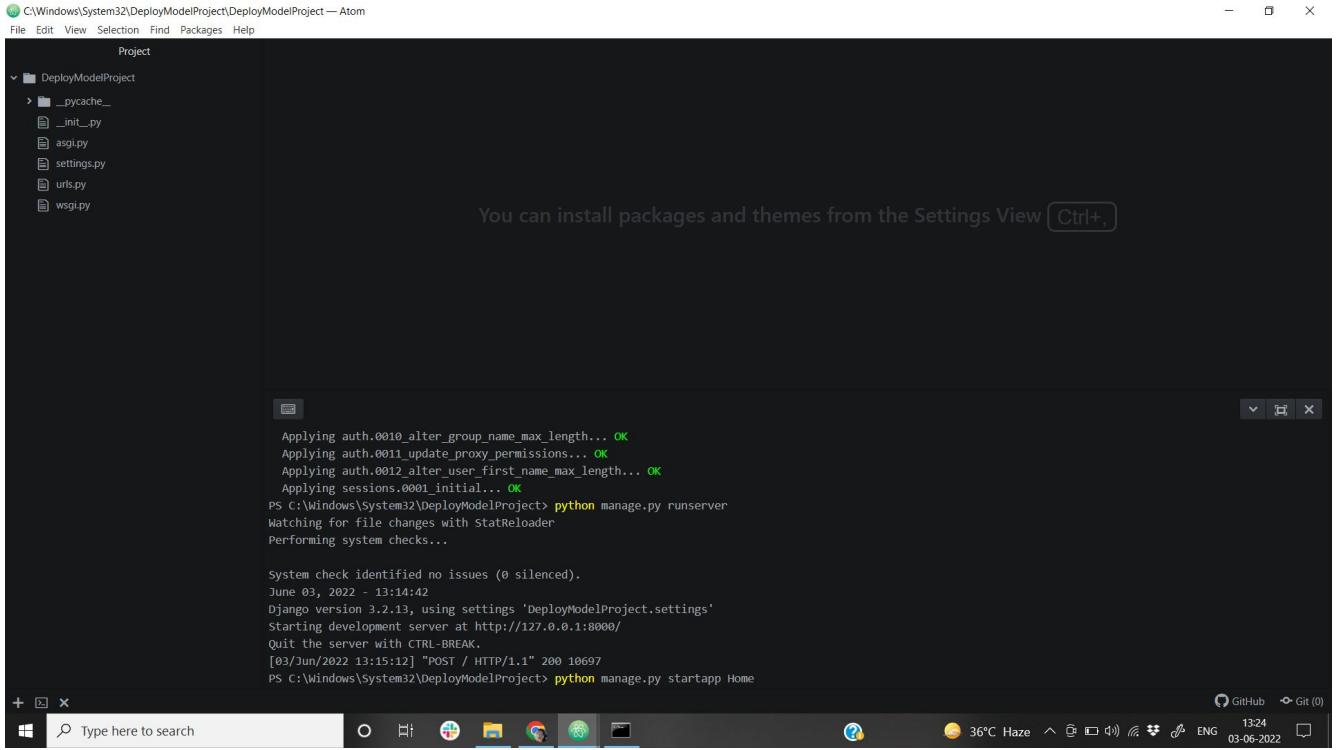
Progress Patch - 1

- **So far you have created a Django Project and started the Django Development Server which will run the application of your project.**
- **This is a lightweight Web server written purely in Python.**
- **By default the runserver command starts the development server on the port 8000.**
- **The server almost always automatically reloads - you have to manually reload if it does not.**
- **As the next step, we have to create an App - to hold/represent/host our ML model.**

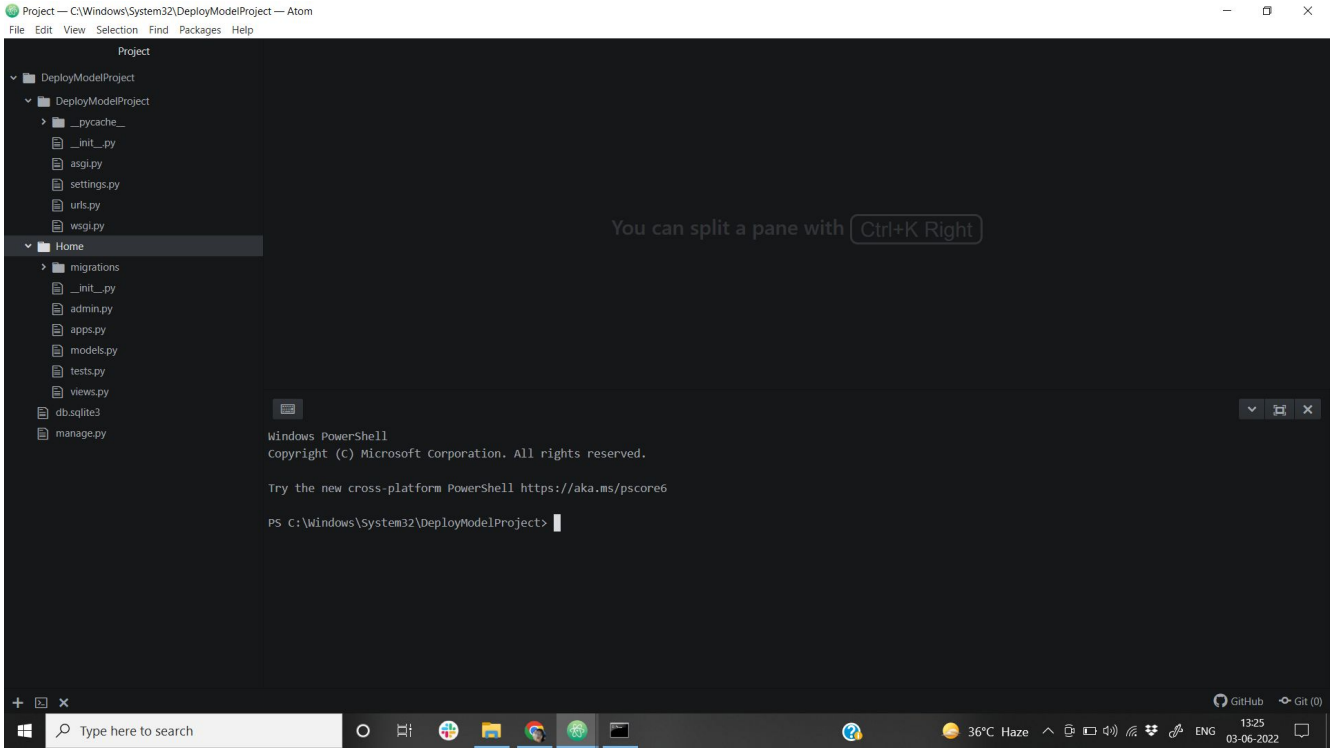
Create an App called Home

- **First close the server by CTRL+C**
- **Type: python manage.py startapp Home**

Create an App called Home - before



Create an App called Home - after



Home App

- It has all python files to represent your app functionality.
- Develop your app and link everything properly.
- Steps:
  - Add ‘Home’ to INSTALLED_APPS[] in settings.py

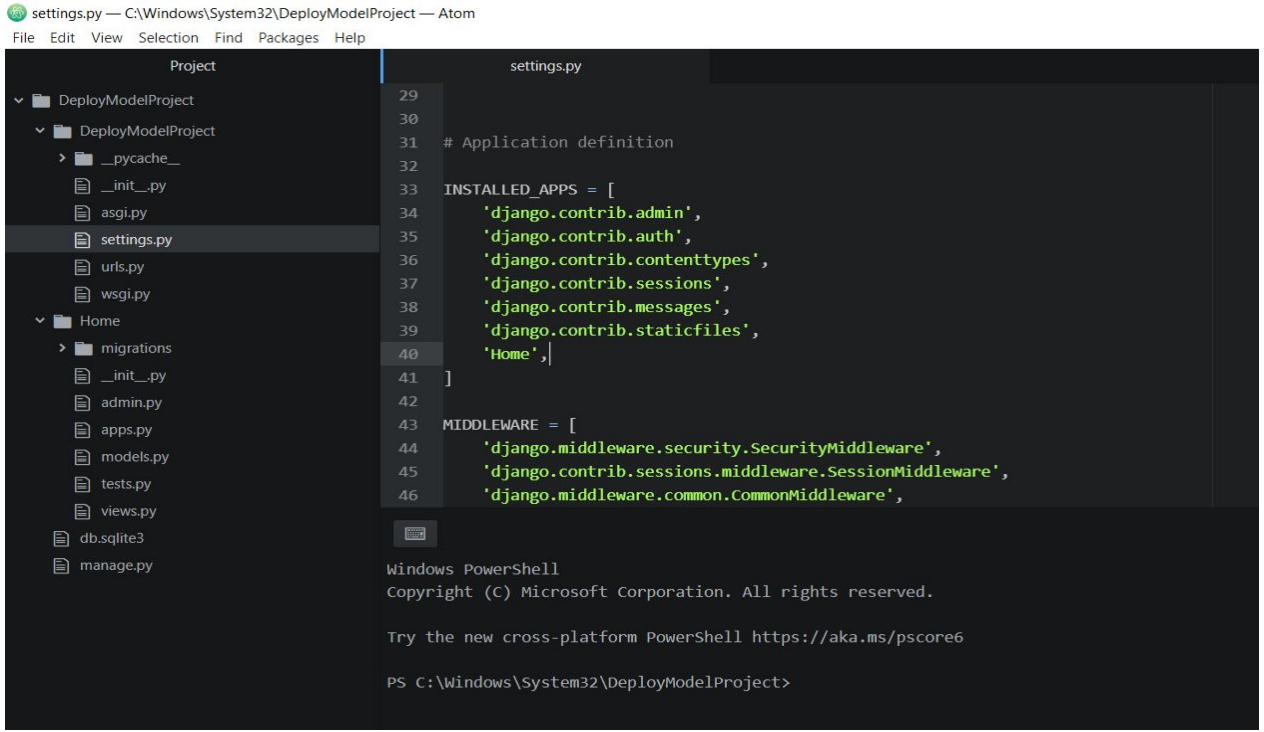
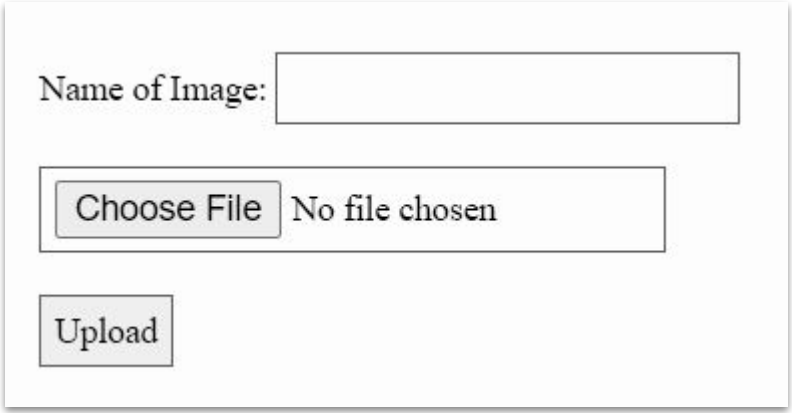


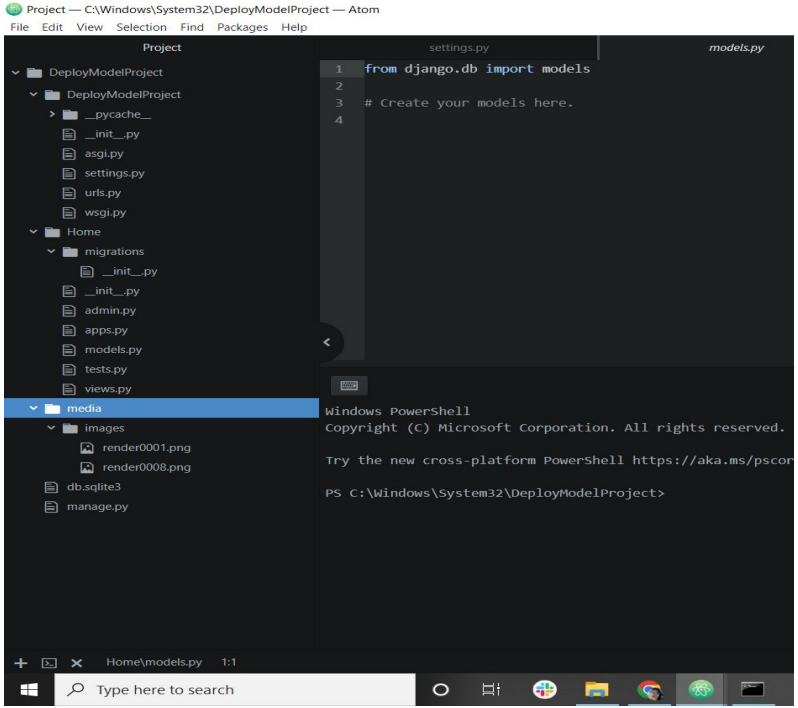
Image Upload Form

- We're assuming that you want to save this image to a database so that you can permanently save it.
- So all images uploaded for prediction are saved to a database in Django - their pathways.
- The actual images are stored in the media directory of the website(project).



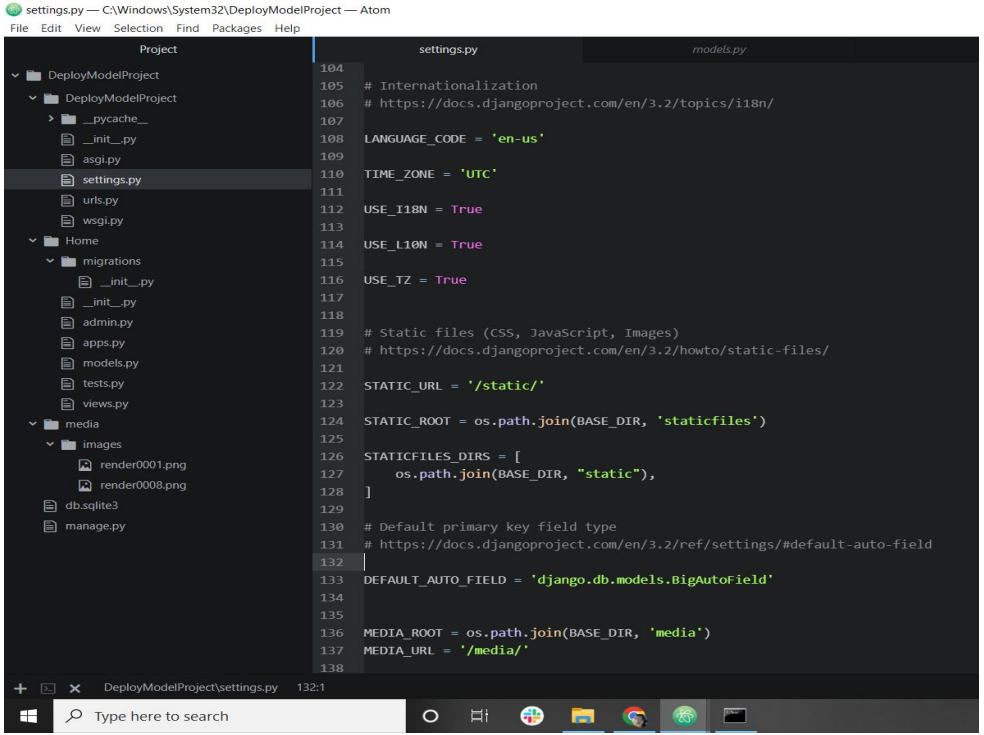
Add Media Directory

- **The first thing you should do is create a media directory in the root project directory of your website.**
- **In order to upload files such as images in Django, you have to make changes to the settings.py file.**

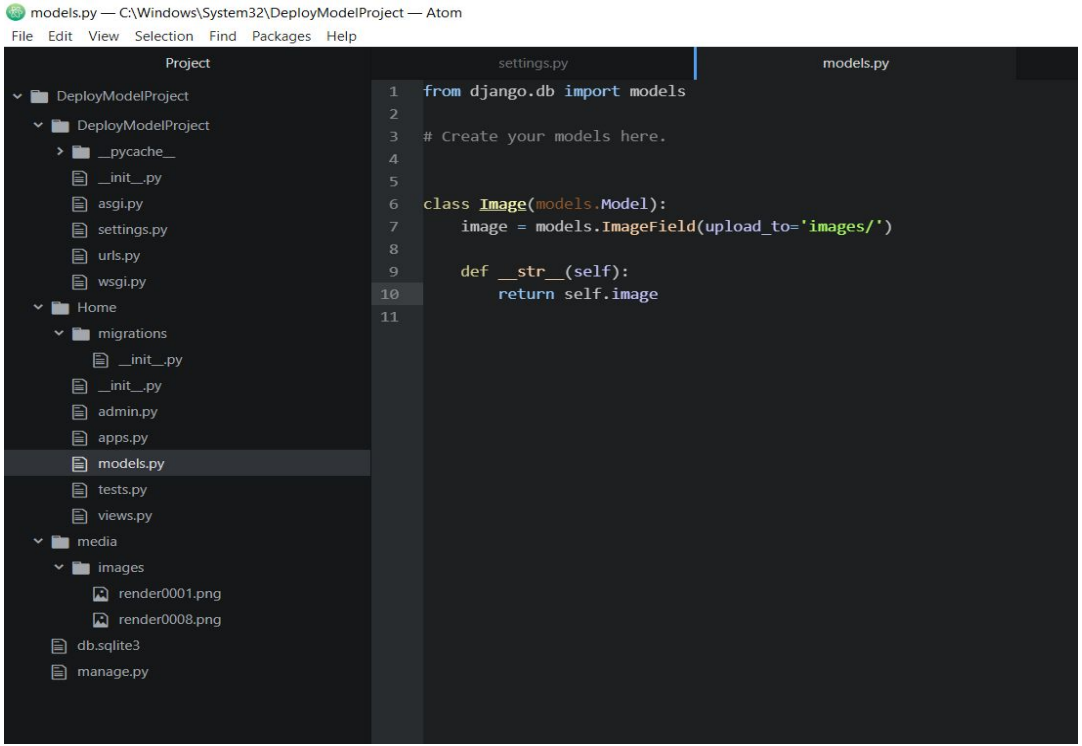


Specify the path to media directory

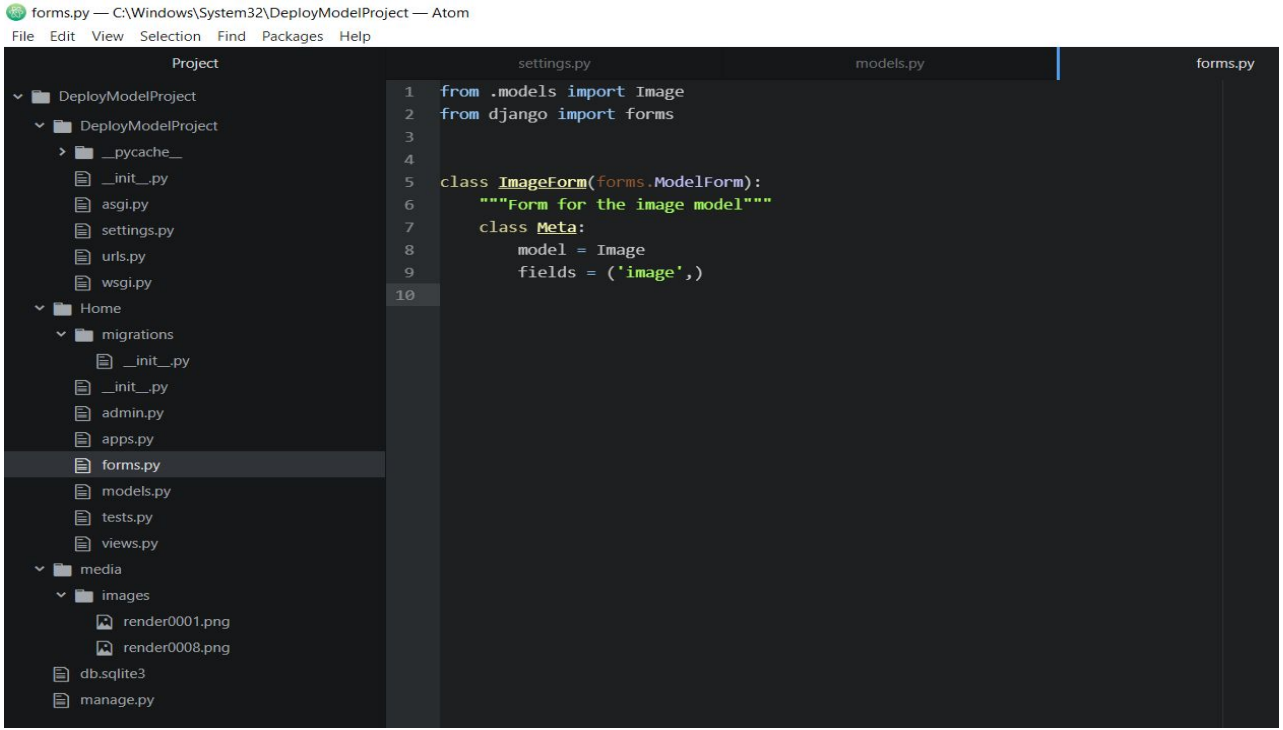
```
STATIC_ROOT = os.path.join(BASE_DIR, 'staticfiles')

STATICFILES_DIRS = [
    os.path.join(BASE_DIR, "static"),
]

MEDIA_ROOT = os.path.join(BASE_DIR, 'media')
MEDIA_URL = '/media/'
```



Update models.py



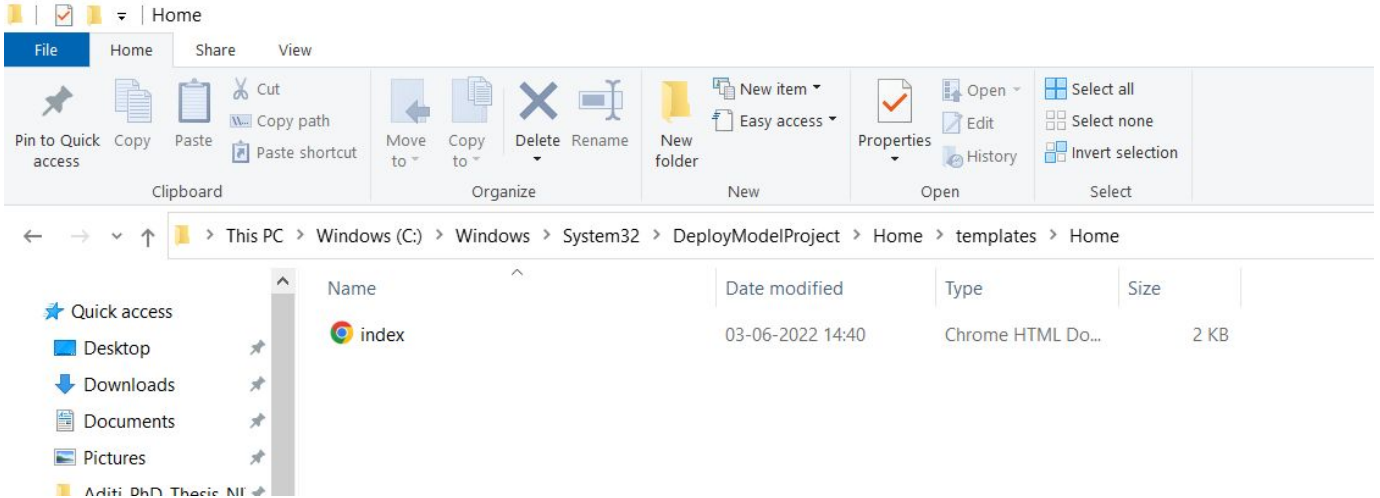
Create forms.py



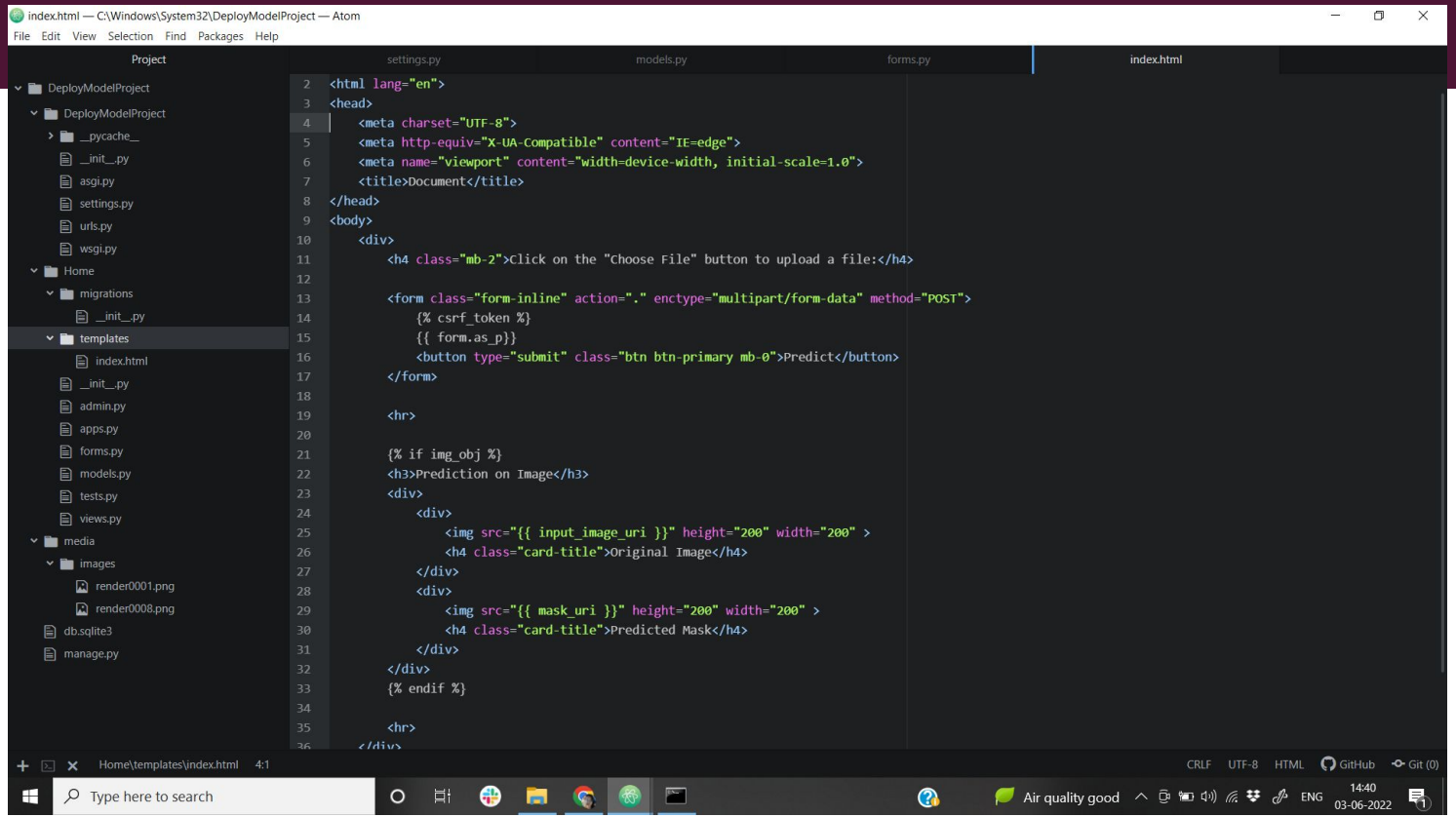
Progress Patch - 2

- **Now we have developed our app structure - added/updated forms.py, models.py**
- **Next we have to add our HTML page and link it to our ML model**

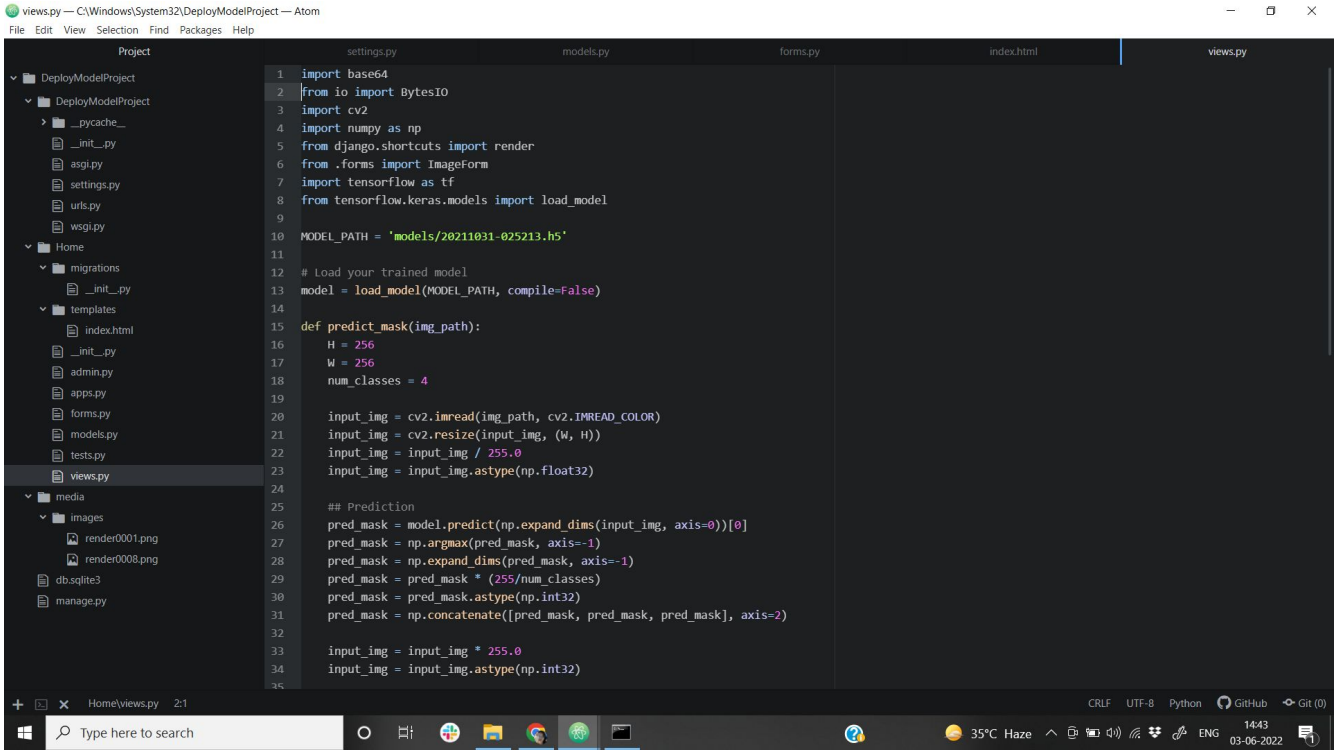
Create templates folder under Home
Create index.html under templates/Home



Index.html will display the upload file option and results



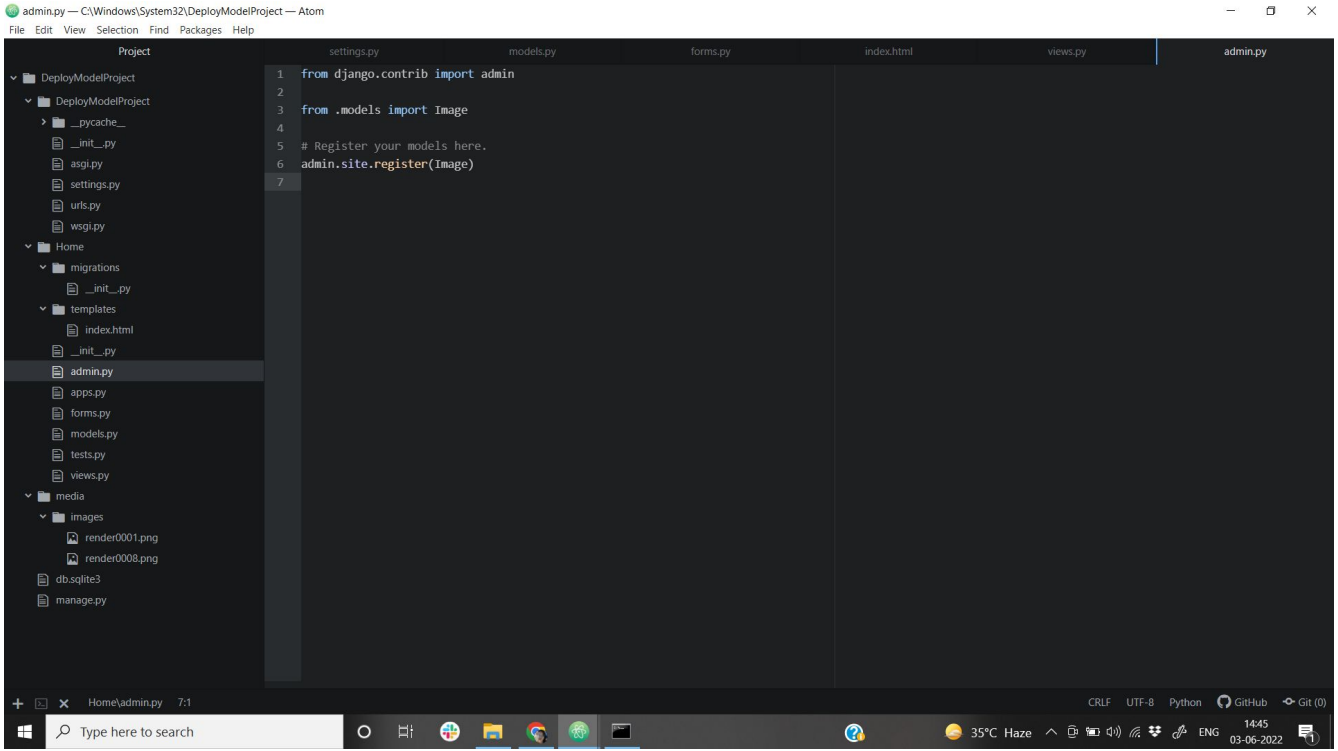
views.py has index function - which will fetch the image object and pass it to predict function



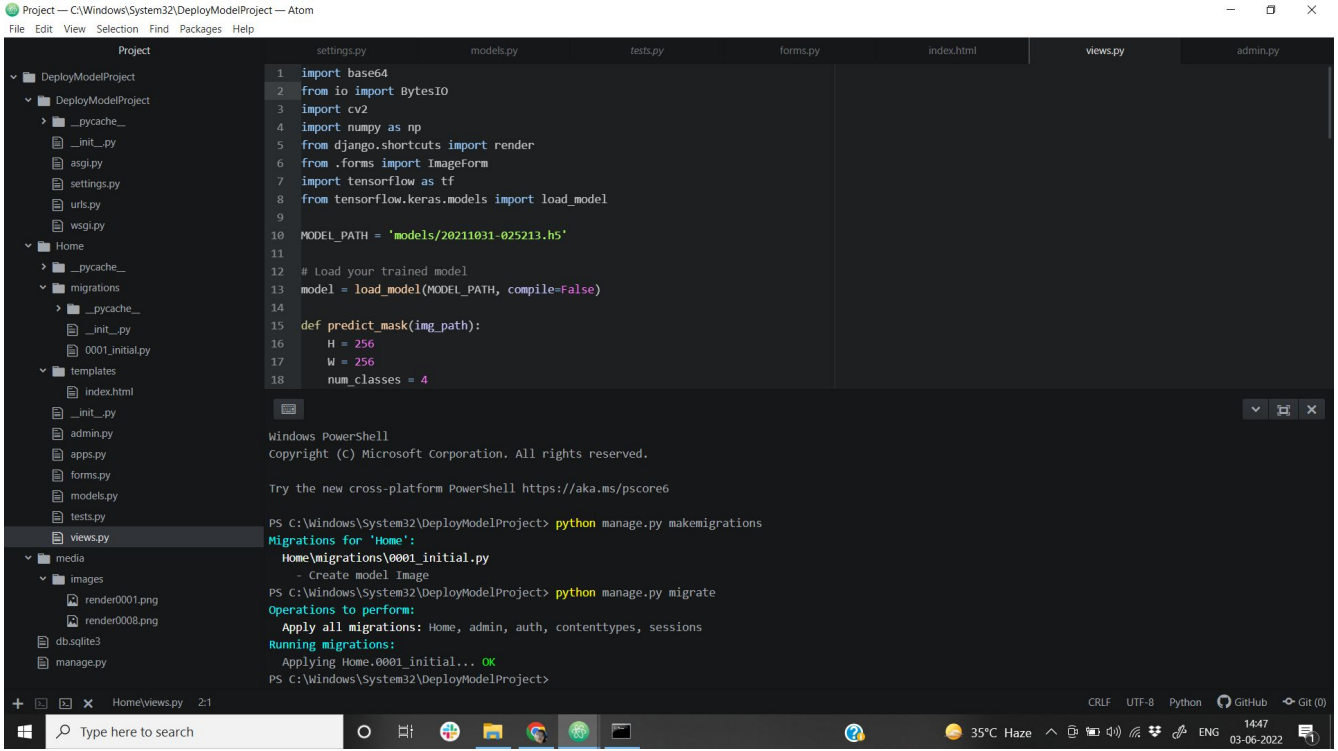
Progress Patch - 3

- **We added our HTML file and linked it to our ML model prediction function!**
- **Now we can register our app and perform migrations.**
- **After that we will link our app with our project directory via urls.py files.**
- **We also need to copy our trained model to our project directory.**
- **Then we can run our ML model on a website!**

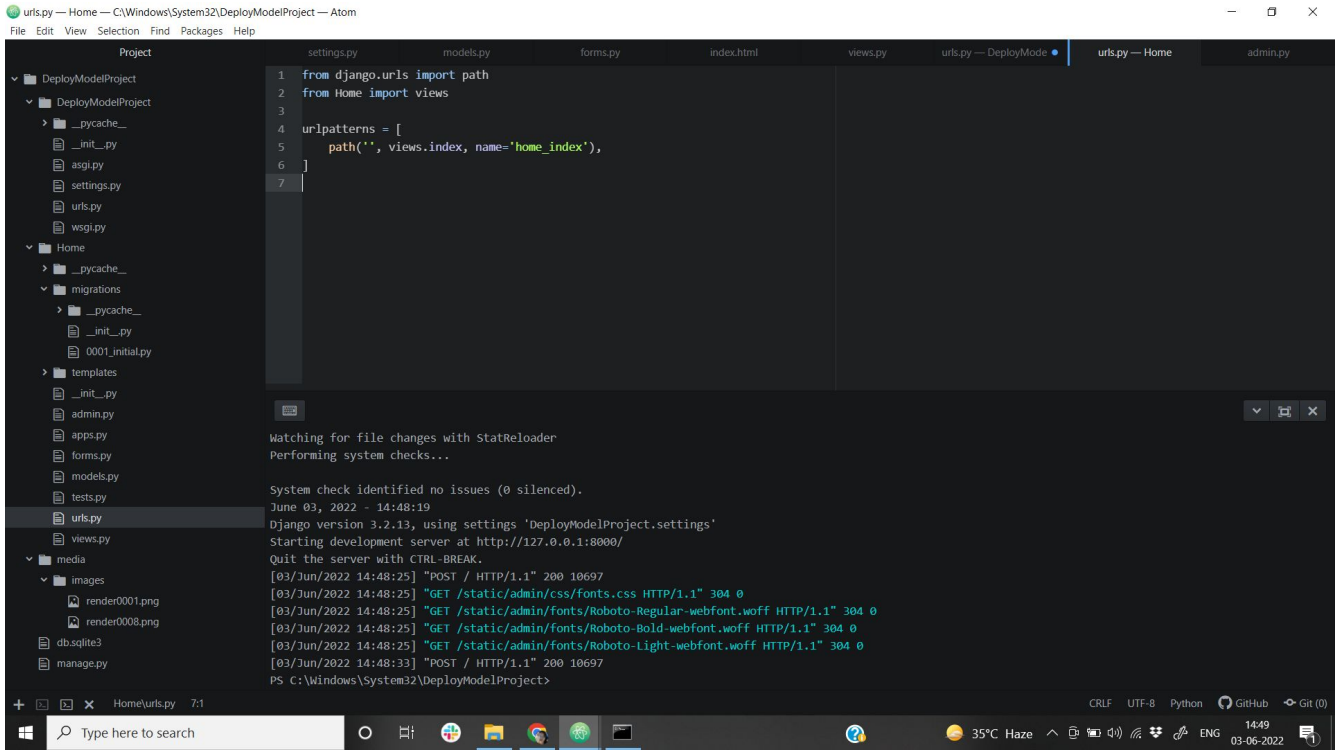
Register app on admin.py



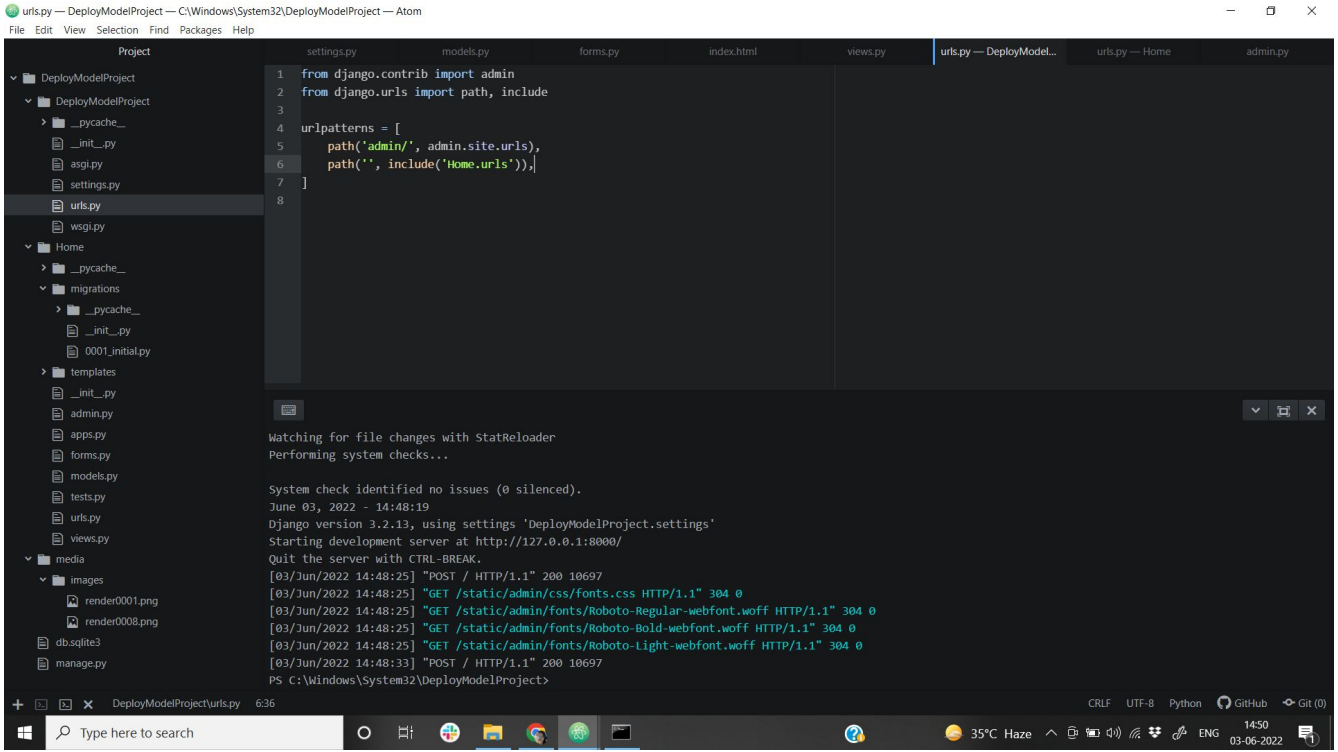
Migrations


Project — C:\Windows\System32\DeployModelProject — Atom
File Edit View Selection Find Packages Help
Project
DeployModelProject
DeployModelProject
__pycache__
__init__.py
asgi.py
settings.py
urls.py
wsgi.py
Home
__pycache__
migrations
__pycache__
__init__.py
0001_initial.py
templates
index.html
__init__.py
admin.py
apps.py
forms.py
models.py
tests.py
views.py
media
images
render0001.png
render0008.png
db.sqlite3
manage.py
settings.py
models.py
tests.py
forms.py
index.html
views.py
admin.py
import base64
from io import BytesIO
import cv2
import numpy as np
from django.shortcuts import render
from .forms import ImageForm
import tensorflow as tf
from tensorflow.keras.models import load_model
MODEL_PATH = 'models/20211031-025213.h5'
# Load your trained model
model = load_model(MODEL_PATH, compile=False)
def predict_mask(img_path):
H = 256
W = 256
num_classes = 4
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.
Try the new cross-platform PowerShell https://aka.ms/pscore6
PS C:\Windows\System32\DeployModelProject> python manage.py makemigrations
Migrations for 'Home':
Home\migrations\0001_initial.py
- Create model Image
PS C:\Windows\System32\DeployModelProject> python manage.py migrate
Operations to perform:
Apply all migrations: Home, admin, auth, contenttypes, sessions
Running migrations:
Applying Home.0001_initial... OK
PS C:\Windows\System32\DeployModelProject>
Home\views.py 2:1
CRLF UTF-8 Python GitHub Git (0)
Type here to search
35°C Haze
ENG
14:47
03-06-2022

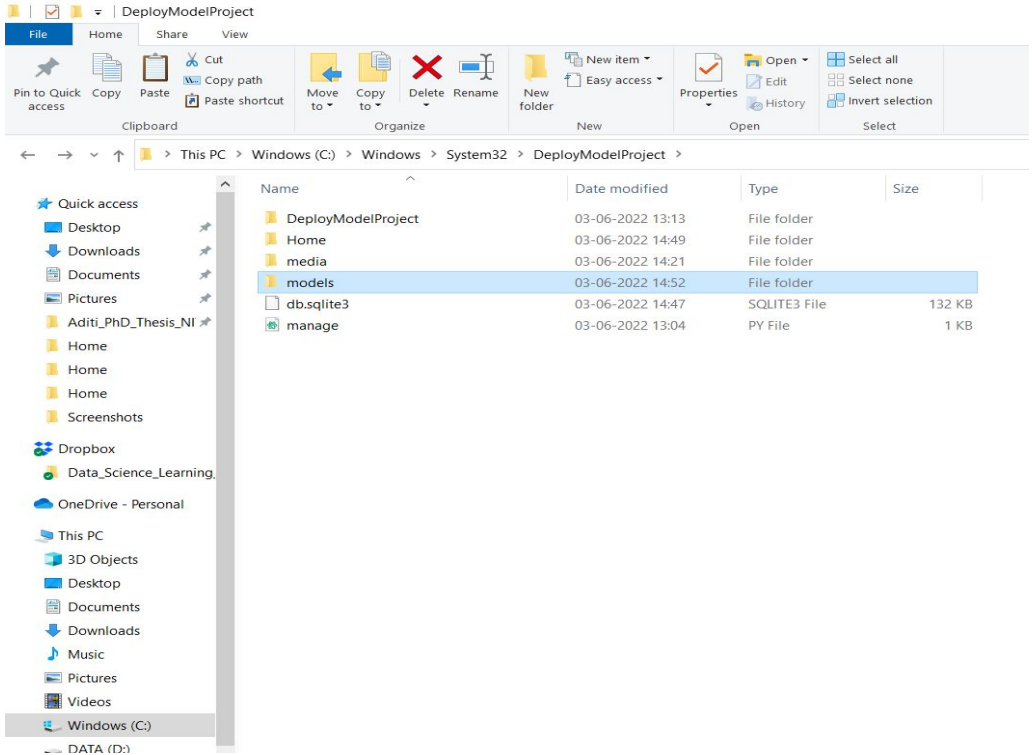
Link via urls.py inside Home



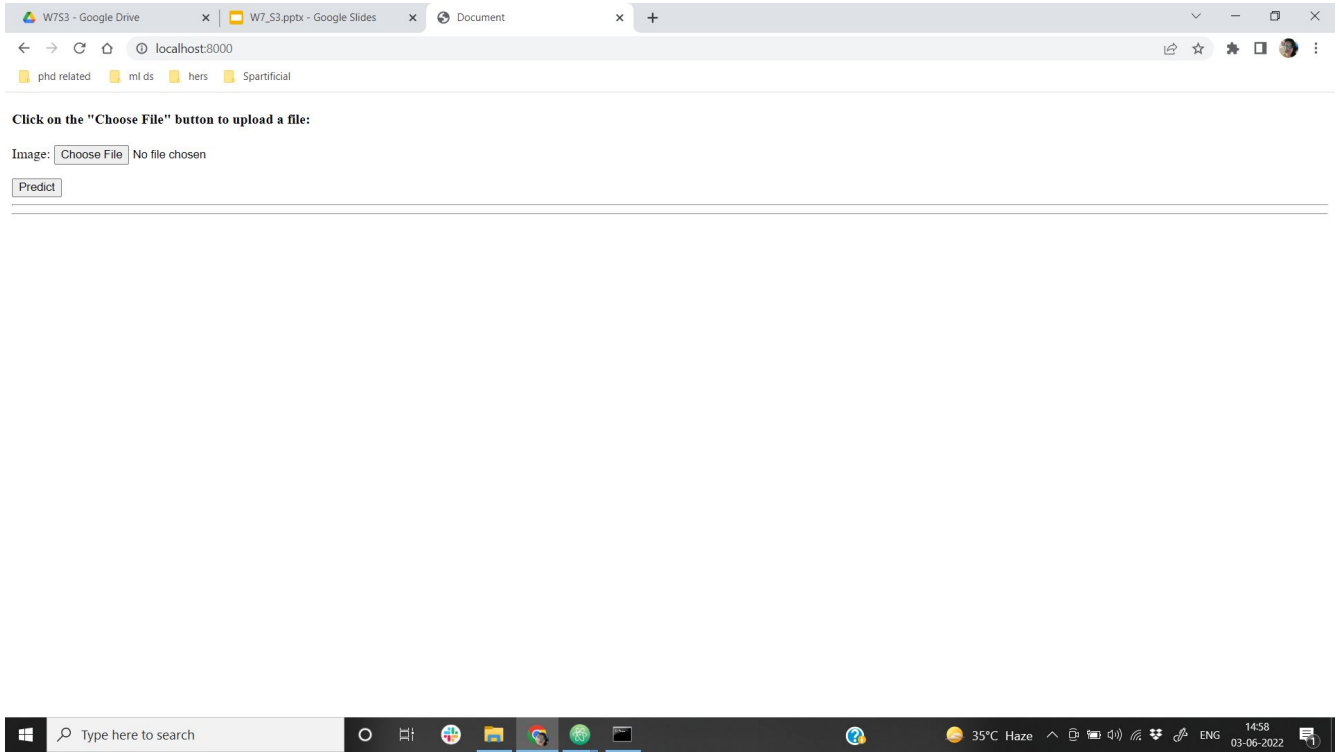
Link via urls.py inside project



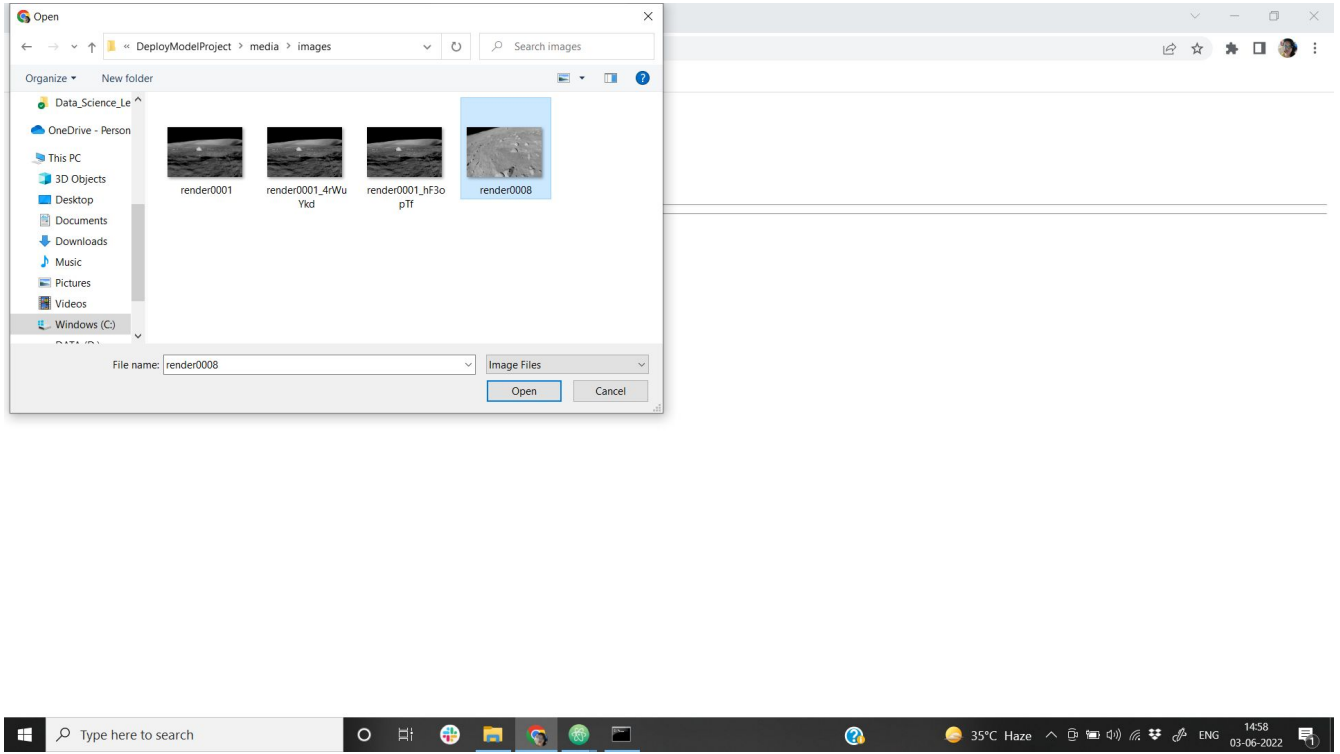
Copy model into project directory



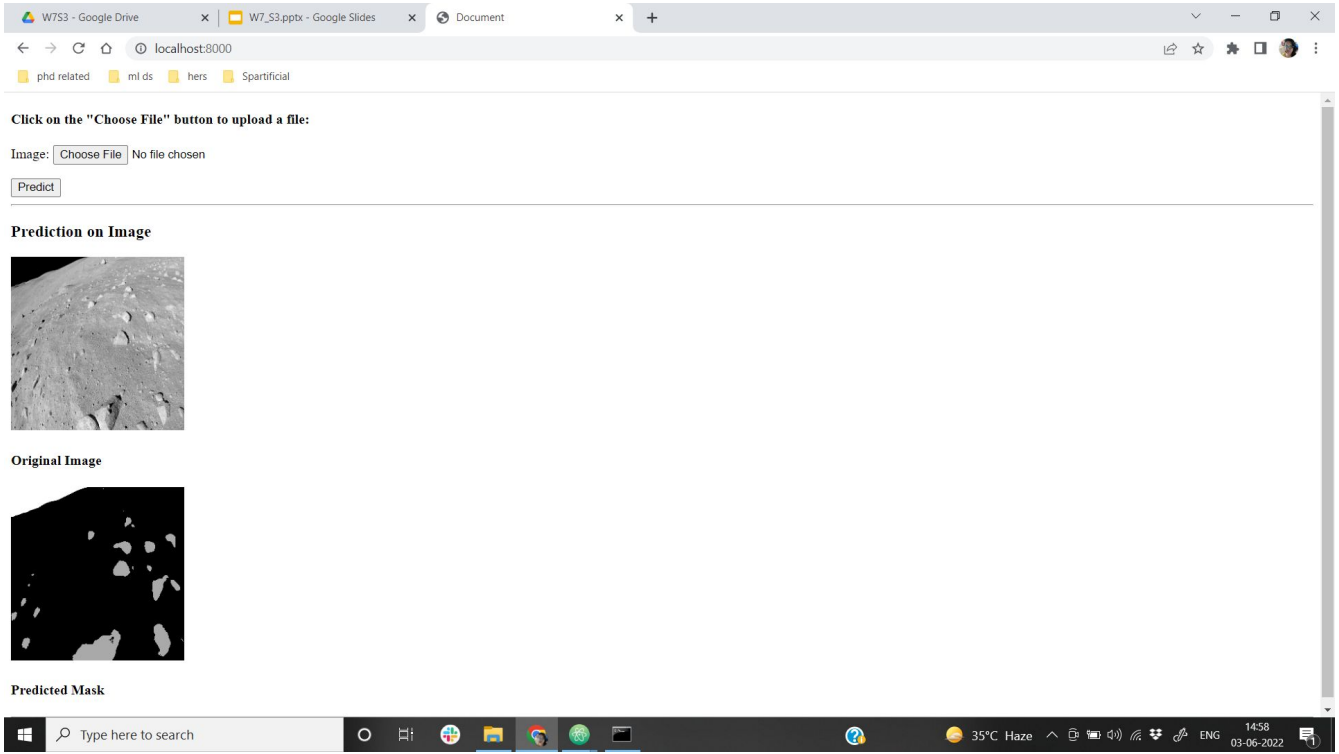
python manage.py makemigrations
python manage.py migrate
python manage.py runserver



python manage.py makemigrations
python manage.py migrate
python manage.py runserver



python manage.py makemigrations
python manage.py migrate
python manage.py runserver



General Guidelines

- Always make sure you choose the parent project folder while opening in Atom
- Run makemigrations and migrate regularly

References

- http://www.learningaboutelectronics.com/Articles/How-to-insert-images-into-a-database-table-with-Python-in-Django.php
- https://docs.djangoproject.com/en/1.11/intro/tutorial01/
- https://www.youtube.com/watch?v=zcALUNZNBUk&ab_channel=SaiPrakashReddy

Time to practice some question!

Q - Create a django app called School which includes a form to insert your school image on it. Also add link to you school website at the top before adding images.
Also take care of the necessary files which needs to be created to work it efficiently.

Note : Go through this PPT before attempting the question.