

## Project Development Phase

### Sprint-3

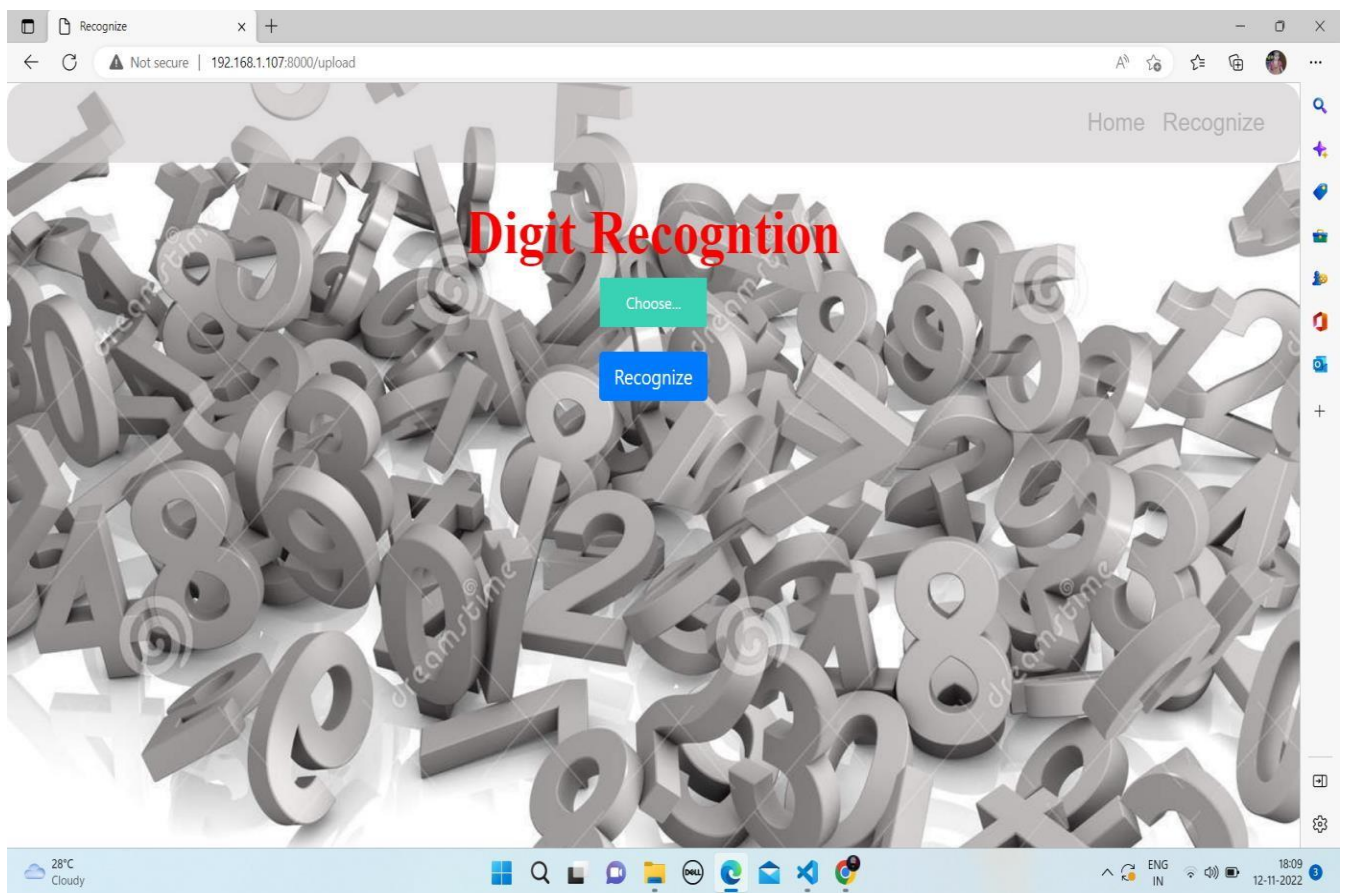
Date	11 November 2022
Team ID	PNT2022TMID39478
Project Name	A Novel Method for Handwritten Digit Recognition System

Home Recognize

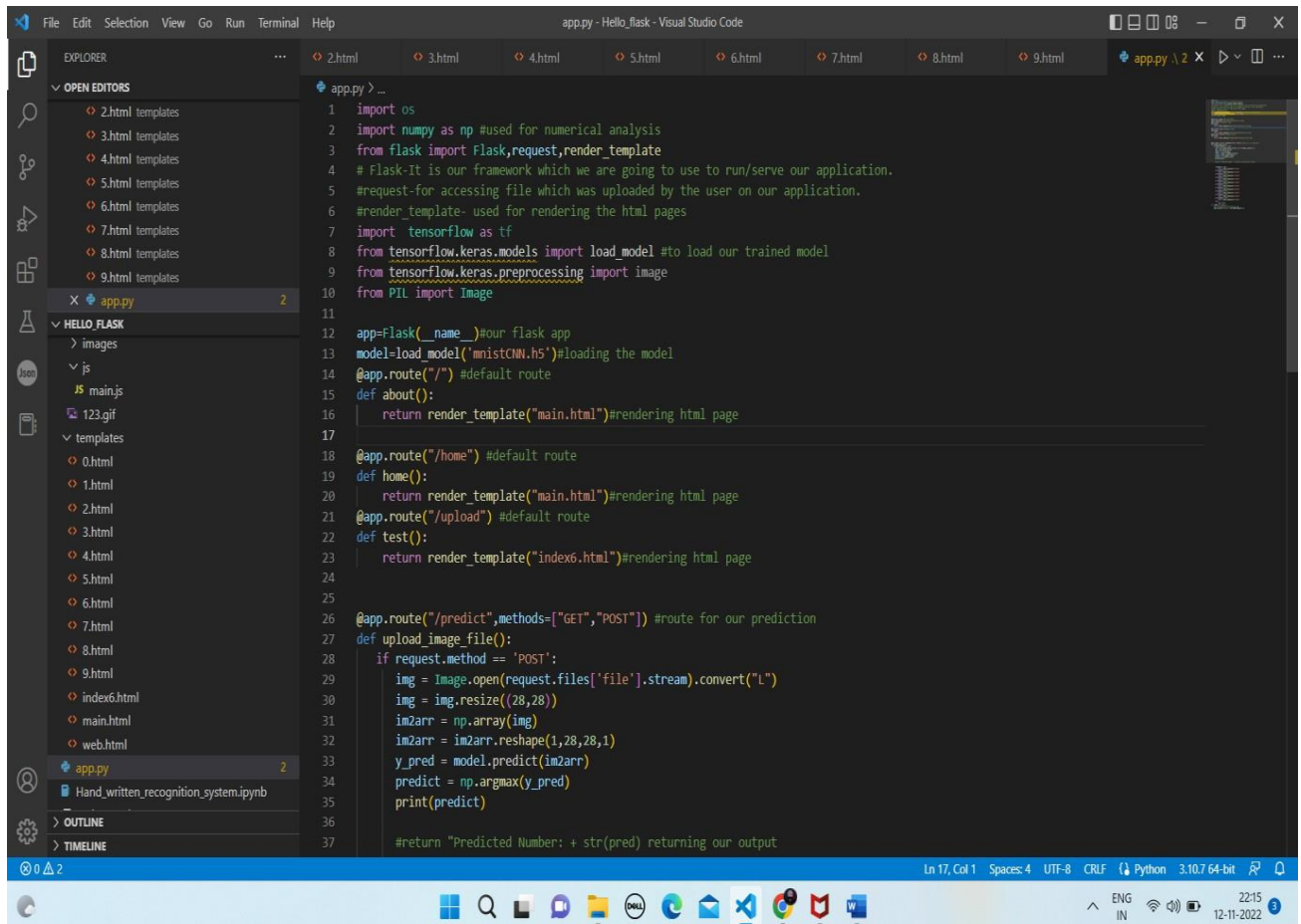
# Handwritten Recognition System

Handwritten Text Recognition is a technology that is much needed in this world as of today. This digit Recognition system is used to recognize the digits from different sources like emails, bank cheque, papers, images, etc. Before proper implementation of this technology we have relied on writing texts with our own hands which can result in errors. It's difficult to store and access physical data with efficiency. The project presents recognizing the handwritten digits (0 to 9) from the famous MNIST dataset. Here we will rising artificial neural networks/convolution neural network

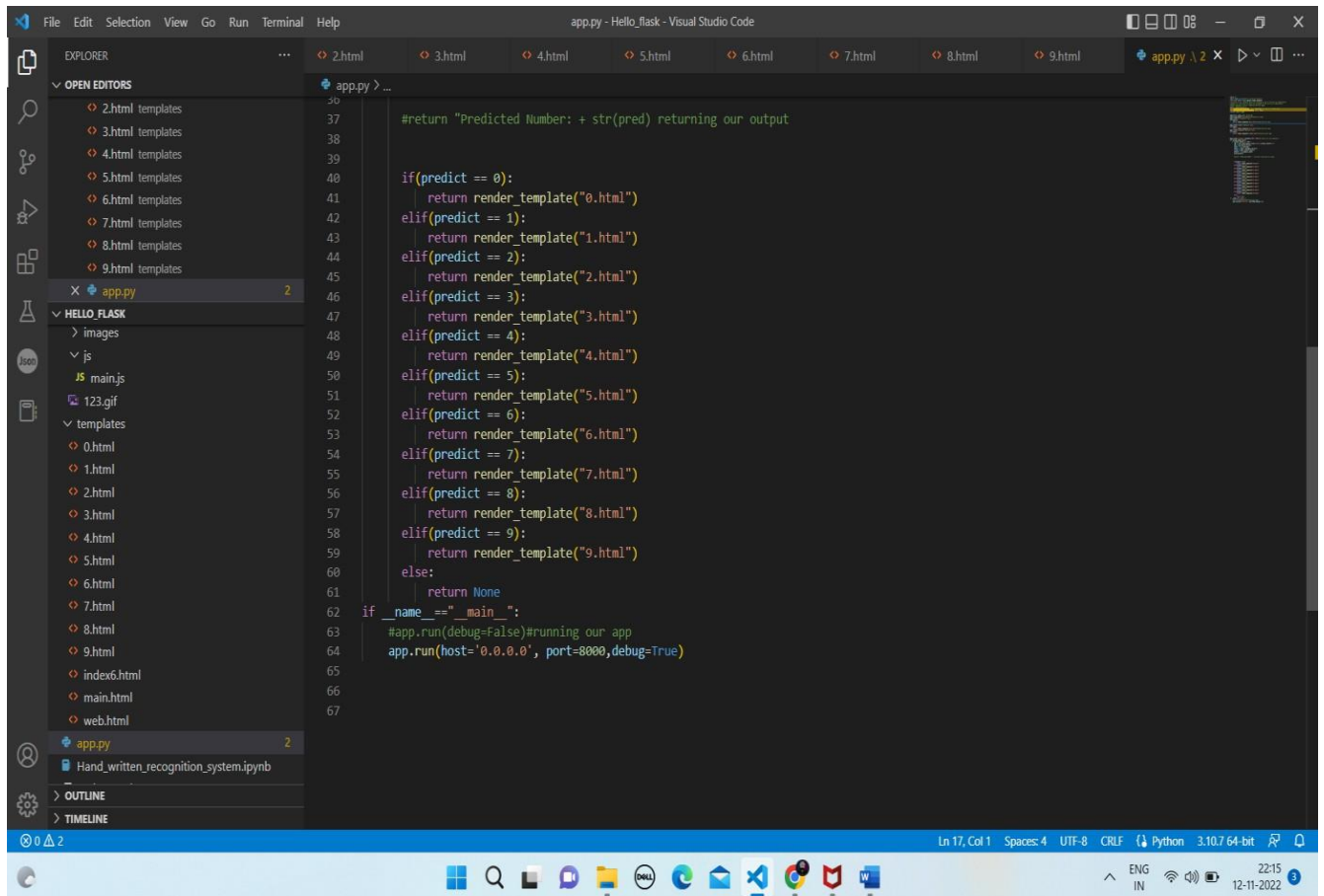
28°C Cloudy 18:08 12-11-2022

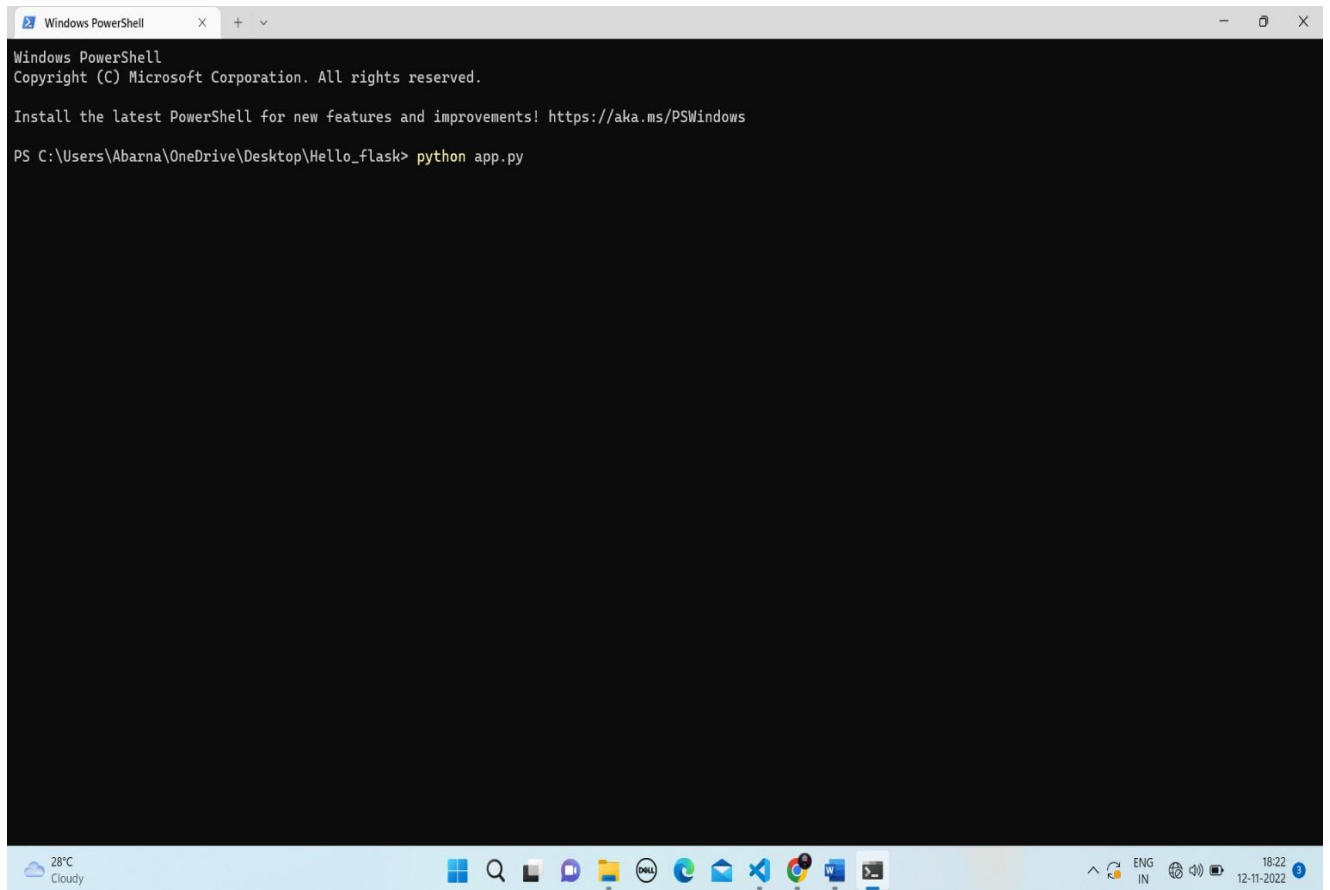


## Python code(app.py)



```
1 import os
2 import numpy as np #used for numerical analysis
3 from flask import Flask,request,render_template
4 # Flask-It is our framework which we are going to use to run/serve our application.
5 #request-for accessing file which was uploaded by the user on our application.
6 #render_template- used for rendering the html pages
7 import tensorflow as tf
8 from tensorflow.keras.models import load_model #to load our trained model
9 from tensorflow.keras.preprocessing import image
10 from PIL import Image
11
12 app=Flask(__name__)#our flask app
13 model=load_model('mnistCNN.h5')#loading the model
14 @app.route("/") #default route
15 def about():
16     return render_template("main.html")#rendering html page
17
18 @app.route("/home") #default route
19 def home():
20     return render_template("main.html")#rendering html page
21 @app.route("/upload") #default route
22 def test():
23     return render_template("index6.html")#rendering html page
24
25
26 @app.route("/predict",methods=["GET","POST"]) #route for our prediction
27 def upload_image_file():
28     if request.method == 'POST':
29         img = Image.open(request.files['file'].stream).convert("L")
30         img = img.resize((28,28))
31         im2arr = np.array(img)
32         im2arr = im2arr.reshape(1,28,28,1)
33         y_pred = model.predict(im2arr)
34         predict = np.argmax(y_pred)
35         print(predict)
36
37     #return "Predicted Number: + str(pred) returning our output
```





A screenshot of a Windows PowerShell terminal window. The window has a title bar with "Windows PowerShell" and standard window controls. The terminal output shows the PowerShell version, copyright information, and a message about installing the latest PowerShell. The user has entered the command `python app.py` at the prompt. The taskbar at the bottom shows the system clock as 18:22 on 12-11-2022, along with various system icons and open applications.

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\Abarna\OneDrive\Desktop\Hello_flask> python app.py
```

```
Windows PowerShell
2022-11-12 18:10:25.200148: I tensorflow/core/platform/cpu_feature_guard.cc:193] This TensorFlow binary is optimized with oneAPI Deep Neural Network Library
(oneDNN) to use the following CPU instructions in performance-critical operations: AVX AVX2
To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.
* Serving Flask app 'app'
* Debug mode: on
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
* Running on all addresses (0.0.0.0)
* Running on http://127.0.0.1:8000
* Running on http://192.168.1.107:8000
Press CTRL+C to quit
* Restarting with stat
2022-11-12 18:10:26.102986: W tensorflow/stream_executor/platform/default/dso_loader.cc:64] Could not load dynamic library 'cuda64_110.dll'; dlerror: cuda
rt64_110.dll not found
2022-11-12 18:10:26.103225: I tensorflow/stream_executor/cuda/cudart_stub.cc:29] Ignore above cudart dlerror if you do not have a GPU set up on your machine
.
2022-11-12 18:10:29.271041: W tensorflow/stream_executor/platform/default/dso_loader.cc:64] Could not load dynamic library 'nvcuda.dll'; dlerror: nvcuda.dll
not found
2022-11-12 18:10:29.271578: W tensorflow/stream_executor/cuda/cuda_driver.cc:263] failed call to cuInit: UNKNOWN ERROR (303)
2022-11-12 18:10:29.278613: I tensorflow/stream_executor/cuda/cuda_diagnostics.cc:169] retrieving CUDA diagnostic information for host: DESKTOP-NA585NJ
2022-11-12 18:10:29.279279: I tensorflow/stream_executor/cuda/cuda_diagnostics.cc:176] hostname: DESKTOP-NA585NJ
2022-11-12 18:10:29.280105: I tensorflow/core/platform/cpu_feature_guard.cc:193] This TensorFlow binary is optimized with oneAPI Deep Neural Network Library
(oneDNN) to use the following CPU instructions in performance-critical operations: AVX AVX2
To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.
* Debugger is active!
* Debugger PIN: 104-326-080
```



