Team ID	PNT2022TMID41253
Project Name	A Novel Method For Handwritten Digit Recognition System

BUILDING PYTHON CODE (PART 1)

```python
import os
import random
import string
from pathlib import Path
import numpy as np
from tensorflow.keras.models import load_model
from PIL import Image, ImageOps
import cv2
def predict(image):
 model=load_model('./Module/model/mnist.h5')
 image = cv2.imread(image)
 grey = cv2.cvtColor(image.copy(), cv2.COLOR_BGR2GRAY)
 ret, thresh = cv2.threshold(grey.copy(), 75, 255, cv2.THRESH_BINARY_INV)
 contours, _ = cv2.findContours(thresh.copy(), cv2.RETR_EXTERNAL, cv2.CHAIN_APPROX_SIMPLE)
 preprocessed_digits = []
 if not contours:
     return False
 for c in contours:
     x,y,w,h = cv2.boundingRect(c)
     cv2.rectangle(image, (x,y), (x+w, y+h), color=(0, 255, 0), thickness=2)
     digit = thresh[y:y+h, x:x+w]
     resized_digit = cv2.resize(digit, (18,18))
     padded_digit = np.pad(resized_digit, ((5,5),(5,5)), "constant", constant_values=0)
     preprocessed_digits.append(padded_digit)
 for digit in preprocessed_digits:
     prediction = model.predict(digit.reshape(1, 28, 28, 1))
     best= np.argmax(prediction)
 return best


```

```python

@app.route('/Authentication', methods = ['POST','GET'])
def Authorize():

    if request.method == "POST":
        if request.form["type"] == "Login":
            email = request.form["email"]
            password = request.form["password"]
            user = db.retreiveUsers(email)
            if user == []:
                return render_template('Authentication.html', msg="User Doesnot Exist")
            if user[0][3] != password:
                return render_template('Authentication.html', msg="Incorrect Password")
            session['user'] = user;
            return redirect(url_for('uploadpage'))

        elif request.form["type"] == "Signup":
            username = request.form["username"]
            email = request.form["email"]
            password = request.form["password"]
            if password != request.form["cpassword"] and '' in [username,email,password]:
                return render_template('Authentication.html', msg="Invalid Data")
            if db.retreiveUsers(username) != []:
                return render_template('Authentication.html', msg="User Already Exist")
            ack = db.insertUser(username, email, password)
            if not ack:
                return render_template('Authentication.html', msg="Invalid Data")
            return render_template('Authentication.html', msg="Successfully Signed In")

    return render_template('Authentication.html')

```