SOURCE CODE

app.py

```
import numpy as np
import os
from PIL import Image
from flask import Flask, request, render_template, url_for
from werkzeug.utils import secure_filename, redirect
from gevent.pywsgi import WSGIServer
from keras.models import load_model
from keras.preprocessing import image
from flask import send_from_directory
UPLOAD_FOLDER = 'C:/Users/ABISHEK/Desktop/selva ibm/Project/uploads'
app = Flask(__name__)
app.config['UPLOAD_FOLDER'] = UPLOAD_FOLDER
model = load_model("C:/Users/ABISHEK/Desktop/selva ibm/Project/CNN-MNIST.h5")
@app.route('/')
def index():
  return render_template('index.html')
@app.route('/predict', methods=['GET', 'POST'])
def upload():
  if request.method == "POST":
    f = request.files["image"]
    filepath = secure_filename(f.filename)
    f.save(os.path.join(app.config['UPLOAD_FOLDER'], filepath))
    upload_img = os.path.join(UPLOAD_FOLDER, filepath)
    img = Image.open(upload_img).convert("L") # convert image to monochrome
    img = img.resize((28, 28)) # resizing of input image
    im2arr = np.array(img) # converting to image
    im2arr = im2arr.reshape(1, 28, 28, 1) # reshaping according to our requirement
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pred = model.predict(im2arr)
    num = np.argmax(pred, axis=1) # printing our Labels
    return render_template('predict.html', num=str(num[0]))
if __name__ == '__main__':
  app.run(debug=True, threaded=False)
index.html
<html>
<head>
 <title>Digit Recognition WebApp</title>
 <meta name="viewport" content="width=device-width">
 <link href="https://fonts.googleapis.com/css2?family=Prompt:wght@600&display=swap"</pre>
rel="stylesheet">
 k href="https://fonts.googleapis.com/css2?family=Varela+Round&display=swap"
rel="stylesheet">
 k
href="https://fonts.googleapis.com/css2?family=Source+Code+Pro:wght@500&display=swap"
rel="stylesheet">
 link
href="https://fonts.googleapis.com/css?family=Calistoga|Josefin+Sans:400,700|Pacifico&display
=swap" rel="stylesheet">
 k rel="stylesheet"
href="https://stackpath.bootstrapcdn.com/bootstrap/4.3.1/css/bootstrap.min.css"
integrity="sha384-
ggOyR0iXCbMQv3Xipma34MD+dH/1fQ784/j6cY/iJTQU0hcWr7x9JvoRxT2MZw1T"
crossorigin="anonymous">
 <link rel="stylesheet" type= "text/css" href= "{{ url_for('static',filename='css/style.css') }}">
 <script src="https://kit.fontawesome.com/b3aed9cb07.js" crossorigin="anonymous"></script>
 <script src="https://code.jquery.com/jquery-3.3.1.slim.min.js" integrity="sha384-</pre>
q8i/X+965DzO0rT7abK41JStQIAqVgRVzpbzo5smXKp4YfRvH+8abtTE1Pi6jizo"
crossorigin="anonymous"></script>
 <script src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.14.7/umd/popper.min.js"</pre>
integrity="sha384-
UO2eT0CpHqdSJQ6hJty5KVphtPhzWj9WO1clHTMGa3JDZwrnQq4sF86dlHNDz0W1"
crossorigin="anonymous"></script>
```

```
<script src="https://stackpath.bootstrapcdn.com/bootstrap/4.3.1/js/bootstrap.min.js"</pre>
integrity="sha384-JjSmVgyd0p3pXB1rRibZUAYoIIy6OrQ6VrjIEaFf/nJGzIxFDsf4x0xIM+B07jRM"
crossorigin="anonymous"></script>
 <script src="https://cdn.jsdelivr.net/npm/@tensorflow/tfjs@latest"></script>
</head>
<script>
function preview() {
  frame.src=URL.createObjectURL(event.target.files[0]);
}
  $(document).ready(function() {
     $('#clear_button').on('click', function() {
       $('#image').val(");
       $('#frame').attr('src',"");
      });
    });
</script>
<body>
 <h1 class="welcome">IBM PROJECT
 <div id="team_id">TEAM ID : PNT2022TMID46095</div>
 </h1>
 <section id="title">
  <h4 class="heading">Handwritten Digit Recognition</h4>
  <br><br>>
 </section>
 <section id="content">
    <div class="leftside">
    <form action="/predict" method="POST" enctype="multipart/form-data">
    <label>Select a image:</label>
    <input id="image" type="file" name="image" accept="image/png, image/jpeg"
onchange="preview()"><br><br>
     <img id="frame" src="" width="100px" height="100px"/>
     <div class="buttons_div">
      <button type="submit" class="btn btn-dark" id="predict_button">Predict</button>
      <button type="button" class="btn btn-dark" id="clear_button">&nbsp Clear &nbsp</button>
     </div>
    </form>
```

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</div>
 </section>
</body>
</html>
predict.html
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Prediction</title>
</head>
<style>
  body{
  background-image: url('static/images/image.jpg');
  background-repeat: no-repeat;
  background-size: cover;
  }
  #rectangle{
  width:250px
  height:100px;
  background-color: #20e4ff;
  border-radius: 25px;
  position:absolute;
  text-align:center;
  top:50%;
  left:50%;
  transform:translate(-50%,-50%);
  }
  #ans{
 text-align: center;
 font-size: 40px;
 margin: 0 auto;
 padding: 3% 5%;
 padding-top: 15%;
 color: white;
```