Skill1

2100030910

Sec-23

App.py

```
from flask import Flask, render_template, request
import tensorflow as tf
import numpy as np

app = Flask(__name__)

class MatrixOperations:
    @staticmethod
    def add_matrices(matrix_a, matrix_b):
        return tf.add(matrix_a, matrix_b).numpy()

    @staticmethod
    def multiply_matrices(matrix_a, matrix_b):
        return tf.matmul(matrix_a, matrix_b).numpy()

    @staticmethod
    def elementwise_multiply(matrix_a, matrix_b):
        return tf.multiply(matrix_a, matrix_b).numpy()

    @staticmethod
    def transpose_matrix(matrix):
        return tf.transpose(matrix).numpy()

    @staticmethod
    def inverse_matrix(matrix):
        return tf.linalg.inv(matrix).numpy()

def parse_matrix(matrix_str):
    rows = matrix_str.strip().split('\n')
    return np.array([list(map(float, row.split())) for row in rows])

@app.route('/home')
def index2():
    return render_template('index.html')

@app.route('/')
def index():
    return "<p>Hello, World!</p>"

@app.route('/matrix_operations', methods=['POST'])
def matrix_operations():
    matrix_a = parse_matrix(request.form['matrix_a'])
    matrix_b = parse_matrix(request.form['matrix_b'])

    result_addition = MatrixOperations.add_matrices(matrix_a, matrix_b)
    result_multiplication = MatrixOperations.multiply_matrices(matrix_a,
matrix_b)
    result_elementwise_multiply =
```

```
MatrixOperations.elementwise_multiply(matrix_a, matrix_b)
    result_transpose_a = MatrixOperations.transpose_matrix(matrix_a)
    result_transpose_b = MatrixOperations.transpose_matrix(matrix_b)

    try:
        result_inverse_a = MatrixOperations.inverse_matrix(matrix_a)
        result_inverse_b = MatrixOperations.inverse_matrix(matrix_b)
    except tf.errors.InvalidArgumentError:
        result_inverse_a = "Matrix A is not invertible"
        result_inverse_b = "Matrix B is not invertible"

    return render_template('result.html',
                           matrix_a=matrix_a,
                           matrix_b=matrix_b,
                           result_addition=result_addition,
                           result_multiplication=result_multiplication,

result_elementwise_multiply=result_elementwise_multiply,
                           result_transpose_a=result_transpose_a,
                           result_transpose_b=result_transpose_b,
                           result_inverse_a=result_inverse_a,
                           result_inverse_b=result_inverse_b)



if __name__ == '__main__':
    app.run(debug=True)
```

templates/index.html

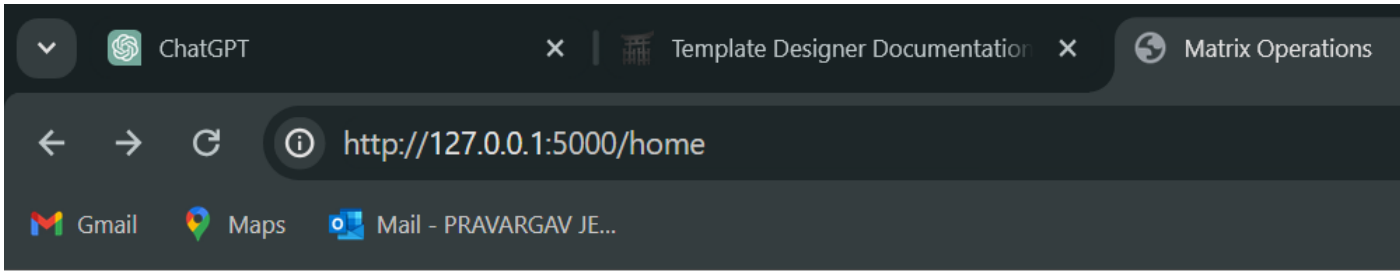
```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Matrix Operations</title>
</head>
<body>
    <h1>Matrix Operations</h1>
    <form action="/matrix_operations" method="post">
        <label for="matrix_a">Matrix A:</label>
        <textarea name="matrix_a" rows="3" cols="30" required>1 2
3 4</textarea>
        <br>
        <label for="matrix_b">Matrix B:</label>
        <textarea name="matrix_b" rows="3" cols="30" required>5 6
7 8</textarea>
        <br>
        <input type="submit" value="Submit">
    </form>
</body>
</html>
```

templates/result.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>Matrix Operations Result</title>
</head>
<body>
    <h1>Matrix Operations Result</h1>
    <h2>Input Matrices:</h2>
    <div>
        <strong>Matrix A:</strong>
        <pre>{{ matrix_a }}</pre>
    </div>
    <div>
        <strong>Matrix B:</strong>
        <pre>{{ matrix_b }}</pre>
    </div>

    <h2>Results:</h2>
    <div>
        <strong>Matrix Addition:</strong>
        <pre>{{ result_addition }}</pre>
    </div>
    <div>
        <strong>Matrix Multiplication:</strong>
        <pre>{{ result_multiplication }}</pre>
    </div>
    <div>
        <strong>Element-wise Matrix Multiplication:</strong>
        <pre>{{ result_elementwise_multiply }}</pre>
    </div>
    <div>
        <strong>Transpose of Matrix A:</strong>
        <pre>{{ result_transpose_a }}</pre>
    </div>
    <div>
        <strong>Transpose of Matrix B:</strong>
        <pre>{{ result_transpose_b }}</pre>
    </div>
    <div>
        <strong>Inverse of Matrix A:</strong>
        <pre>{{ result_inverse_a }}</pre>
    </div>
    <div>
        <strong>Inverse of Matrix B:</strong>
        <pre>{{ result_inverse_b }}</pre>
    </div>
</body>
</html>
```

Outputs-

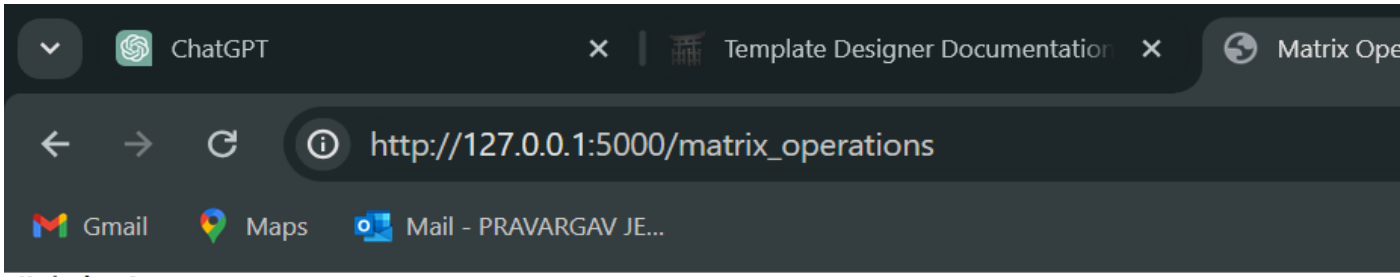


Matrix Operations

Matrix A:
1 2
3 4

Matrix B:
5 6
7 8

Submit



Matrix A:

```
[[1. 2.]
 [3. 4.]]
```

Matrix B:

```
[[5. 6.]
 [7. 8.]]
```

Results:

Matrix Addition:

```
[[ 6.  8.]
 [10. 12.]]
```

Matrix Multiplication:

```
[[19. 22.]
 [43. 50.]]
```

Element-wise Matrix Multiplication:

```
[[ 5. 12.]
 [21. 32.]]
```

Transpose of Matrix A:

```
[[1. 3.]
 [2. 4.]]
```

Transpose of Matrix B:

```
[[5. 7.]
 [6. 8.]]
```

Inverse of Matrix A:

```
[[-2.   1. ]
 [ 1.5 -0.5]]
```

Inverse of Matrix B:

```
[[-4.   3. ]
 [ 3.5 -2.5]]
```