Experiment 4 : Flask Application using GET and POST

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AIM : To design a Flask application that showcases URL building and demonstrates the use of HTTP methods (`GET` and `POST`) for handling user input and processing data.

PROBLEM STATEMENT :

Create a Flask application with the following requirements:

1. **A homepage (`/`) with links to a "Profile" page and a "Submit" page using the `url_for()` function.**
2. **The "Profile" page (`/profile/<username>`) dynamically displays a user's name passed in the URL.**
3. **A "Submit" page (`/submit`) displays a form to collect the user's name and age. The form uses the POST method to send the data, and the server displays a confirmation message with the input.**

Theory:

1. What is a route in Flask, and how is it defined?

In Flask, a **route** is a URL pattern that is associated with a specific function in a web application. When a user visits a particular URL, Flask executes the corresponding function and returns the response. Routes define how the application should respond to different URLs.

A route is defined using the `@app.route()` decorator. For example:

python CopyEdit `from flask import Flask`

```
app = Flask(__name__)
```

```
@app.route('/') def home():
      return "Welcome to
Flask!"
```

In this example, the root URL (`/`) is mapped to the `home` function, which returns a simple text response.

2. How can you pass parameters in a URL route?

In Flask, parameters can be passed in a URL route using angle brackets (`< >`). These parameters can be dynamic and help in passing values from the URL to the function.

For example:

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```
@app.route('/user/<name>')
def greet_user(name):
return f"Hello, {name}!"
```

Here, when a user visits `/user/Sanket`, the function receives `"Sanket"` as the `name` parameter and returns `"Hello, Sanket!"`.

Flask also allows specifying the data type of parameters, such as:

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```
@app.route('/square/<int:num>') def
square(num):    return f"The square of
{num} is {num**2}"
```

This ensures that `num` is treated as an integer.

3. What happens if two routes in a Flask application have the same URL pattern?

If two routes have the same URL pattern in a Flask application, only the last defined route will take effect, and the previous one will be overridden. Flask does not allow duplicate routes with the same URL pattern, as it would cause ambiguity.

Example of conflicting routes:

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```
@app.route('/hello')
def hello1():
     return "Hello from function
1"

@app.route('/hello') def
hello2():  return "Hello from
function 2"
```

In this case, when a user visits `/hello`, Flask will only execute `hello2()`, and `hello1()` will be ignored.

4. What are the commonly used HTTP methods in web applications?

The most commonly used HTTP methods in web applications are:

1. **GET** – Requests data from the server (e.g., retrieving a webpage).
2. **POST** – Sends data to the server (e.g., submitting a form).
3. **PUT** – Updates existing data on the server.
4. **DELETE** – Removes a resource from the server.
5. **PATCH** – Partially updates a resource.

In Flask, these methods can be specified in the `methods` parameter of the `@app.route()` decorator:

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```
@app.route('/submit',
methods=['POST']) def submit():
return "Form submitted!"
```

5. What is a dynamic route in Flask?

A **dynamic route** in Flask is a route that contains variables, allowing it to handle multiple different URLs with a single function. Dynamic routes make the web application more flexible by enabling the use of parameters within the URL.

Example:

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```
@app.route('/user/<username>') def
profile(username):    return f"User
Profile: {username}"
```

If a user visits `/user/Sanket`, the function receives `"Sanket"` as a parameter and responds accordingly.

6. Write an example of a dynamic route that accepts a username as a parameter.

python CopyEdit `from`

```
flask import Flask

app = Flask(__name__)

@app.route('/user/<username>')
def show_user(username):   return
f"Welcome, {username}!"
 if __name__ ==
'__main__':
app.run(debug=True)
```

In this example, the route `/user/<username>` accepts a `username` parameter from the URL and returns a personalized welcome message.

7. What is the purpose of enabling debug mode in Flask?

Enabling **debug mode** in Flask is useful for development because it provides:

1. **Automatic Code Reloading** – The server automatically restarts when changes are made to the code.
2. **Detailed Error Messages** – Flask displays an interactive debugger when an error occurs, making it easier to identify and fix issues.

However, debug mode should **not** be enabled in a production environment due to security risks.

8. How do you enable debug mode in a Flask application?

Debug mode can be enabled in two ways:

1. Setting debug=True in app.run()

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

2. **Using Environment Variables**

In the terminal, set the environment variable before running the Flask app:

sh
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```
export FLASK_ENV=development
flask run
```

On Windows (Command Prompt):

sh
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```
set FLASK_ENV=development
flask run
```

This enables debug mode and allows for easier debugging during development.

Code:

app.py:

```
from flask import Flask, request, url_for, redirect, render_template, session

app = Flask(__name__)
app.secret_key = 'supersecretkey123'
```

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


@app.route('/profile/<username>')
def profile(username):
    name = session.get('name', 'Guest')
    age = session.get('age', 'Unknown')
    return render_template('profile.html', username=username, name=name, age=age)

@app.route('/submit', methods=['GET', 'POST'])
def submit():
    if request.method == 'POST':
        session['name'] = request.form.get('name', 'Unknown')
        session['age'] = request.form.get('age', 'Unknown')
        return redirect(url_for('profile', username=session['name']))

    return render_template('submit.html')

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

home.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Homepage</title>
    <style>
        body {
            background: linear-gradient(to right, #fbc2eb, #a6c1ee);
            text-align: center;
            color: #333;
        }
         {
            display: inline-block;
            margin: 10px;
            padding: 10px;
```

```
            background: rgba(0, 0, 0, 0.2);
            text-decoration: none;
            color: white;
            border-radius: 5px;
        }
        a:hover {
            background: rgba(0, 0, 0, 0.5);
        }
    </style>
</head>
<body>
    <h1>Welcome to the Homepage</h1>
    <a href="{{ url_for('profile', username='Guest') }}">Go to Profile</a>
    <a href="{{ url_for('submit') }}">Go to Submit Page</a>
</body>
</html>
```

profile.html

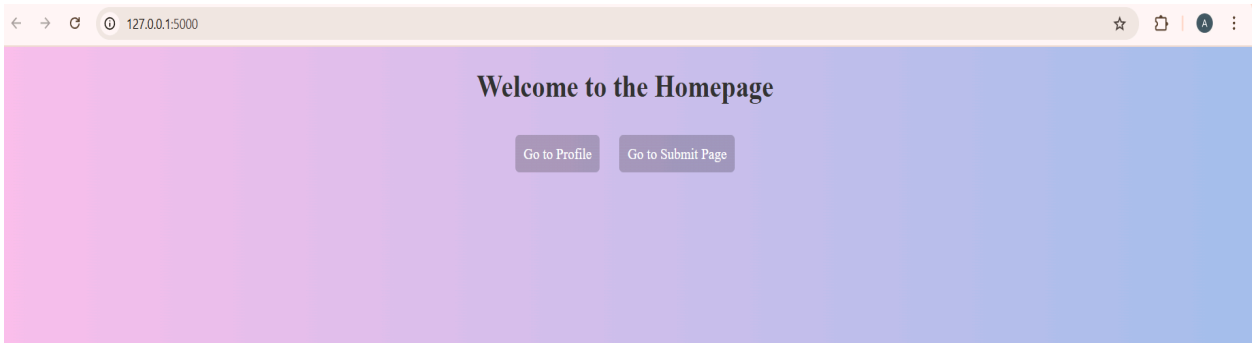
```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Profile Page</title>
    <style>
        body {
            background: linear-gradient(to right, #ffafbd, #ffc3a0);
            text-align: center;
            color: #333;
        }
    </style>
</head>
<body>
    <h1>Profile Page</h1>
    <p><strong>Name:</strong> {{ username }}</p>
    <p><strong>Age:</strong> {{ age }}</p>
</body>
</html>
```

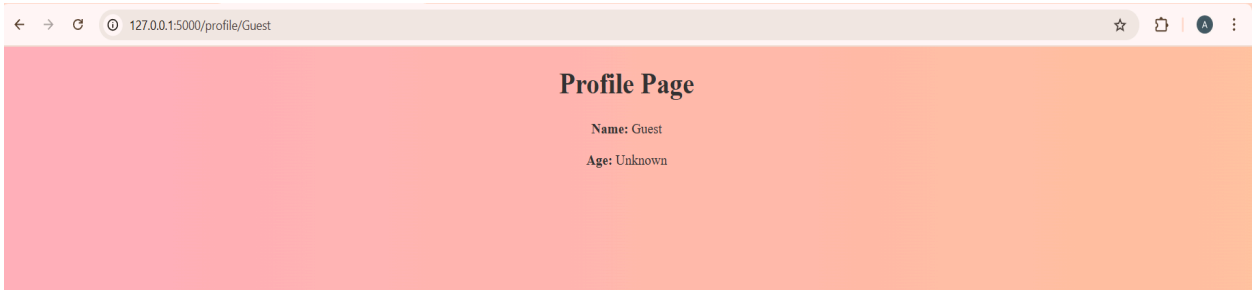
submit.html:

```
<!DOCTYPE html>
<html lang="en">
```

```
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Submit Page</title>
    <style>
        body {
            background: linear-gradient(to right, #fbc2eb, #a6c1ee);
            text-align: center;
            color: #333;
        }
        form {
            display: inline-block;
            background: rgba(0, 0, 0, 0.2);
            padding: 20px;
            border-radius: 10px;
        }
        input {
            margin: 5px;
            padding: 10px;
            border-radius: 5px;
            border: none;
        }
        input[type="submit"] {
            background: rgba(0, 0, 0, 0.5);
            color: white;
            cursor: pointer;
        }
    </style>
</head>
<body>
    <h1>Submit Page</h1>
    <form method="POST">
        <label for="name">Name:</label>
        <input type="text" id="name" name="name" required><br>
        <label for="age">Age:</label>
        <input type="number" id="age" name="age" required><br>
        <input type="submit" value="Submit">
    </form>
</body>
</html>
```

Output:


127.0.0.1:5000
Welcome to the Homepage
Go to Profile
Go to Submit Page


127.0.0.1:5000/profile/Guest
Profile Page
Name: Guest
Age: Unknown


127.0.0.1:5000/submit
Submit Page
Name: Shraeyaa
Age: 20
Submit


127.0.0.1:5000/profile/Shraeyaa
Profile Page
Name: Shraeyaa
Age: 20