EXPERIMENT NO. 4

Name of Student	Arnav Santosh Sawant
Class Roll No	D15A - 52
D.O.P.	18/02/25
D.O.S.	
Sign and Grade	

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?**

A route in Flask is a URL pattern that is bound to a Python function (view function). When a user visits a URL that matches the pattern, the corresponding function is executed. Routes are defined using the *@app.route*() decorator (or *@blueprint.route*() for blueprints).

For example:

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

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

You can pass parameters by including them in the URL pattern using angle brackets. Flask automatically extracts these parameters and passes them as arguments to the view function. For example:

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

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

If two routes have the same URL pattern, the latter definition will override the earlier one. Only the function associated with the final declaration will be used, potentially leading to unexpected behavior.

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

The most common HTTP methods are:

- **GET:** Retrieve data from the server.
- **POST:** Send new data to the server (e.g., form submissions).
- **PUT:** Update existing data on the server.
- **DELETE:** Remove data from the server.
  Other methods include PATCH, OPTIONS, etc., but GET and POST are by far the most frequently used in web applications.

5. What is a dynamic route in Flask?

A dynamic route is one that contains variable parts, allowing the URL to change based on user input or other parameters. This enables the application to generate content dynamically based on the parameters provided in the URL.

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

```
@app.route('/profile/<username>')
def profile(username):
return f"Welcome to {username}'s profile!"
```

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

Enabling debug mode in Flask helps during development by:

- Automatically reloading the server when code changes are detected.
- Providing detailed error messages and stack traces in the browser when an error occurs.
  This makes it easier to diagnose and fix issues during development, but debug mode should be disabled in production for security reasons.

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

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

Code:-

app.py
```
from flask import Flask, render_template, request, redirect, url_for


app = Flask(__name__)


@app.route('/')

def home():

    return render_template('home.html')
```

```python
@app.route('/profile/<username>')

def profile(username):

    return render_template('profile.html', username=username)


@app.route('/submit', methods=['GET', 'POST'])

def submit():

    if request.method == 'POST':

        name = request.form['name']

        age = request.form['age']

        return render_template('submit.html', name=name, age=age, submitted=True)

    return render_template('submit.html', submitted=False)


if __name__ == '__main__':

    app.run(debug=True)
```

templates/home.html
```html
<!DOCTYPE html>

<html>

<head>

    <title>Home</title>

    <style>

        body {

            font-family: Arial, sans-serif;

            background-color: #e0f7fa;
```

```html
            text-align: center;

            padding-top: 100px;

        }

        h1 {

            color: #00796b;

        }

        a {

            display: inline-block;

            margin: 20px;

            padding: 12px 25px;

            background-color: #00796b;

            color: white;

            text-decoration: none;

            border-radius: 8px;

            font-size: 18px;

        }

        a:hover {

            background-color: #004d40;

        }

    </style>

</head>

<body>

    <h1>Welcome to the Homepage</h1>

    <a href="{{ url_for('profile', username='Guest') }}">Go to Profile</a>
```

```html
    <a href="{{ url_for('submit') }}">Submit Info</a>

</body>

</html>
```

templates/profile.html
```html
<!DOCTYPE html>

<html>

<head>

    <title>Profile</title>

    <style>

        body {

            font-family: Arial, sans-serif;

            background-color: #f3e5f5;

            text-align: center;

            padding-top: 100px;

        }

        h1 {

            color: #6a1b9a;

        }

        a {

            margin-top: 30px;

            display: inline-block;

            padding: 10px 20px;

            background-color: #6a1b9a;

            color: white;
```

```
            text-decoration: none;

            border-radius: 6px;

        }

        a:hover {

            background-color: #4a0072;

        }

    </style>

</head>

<body>

    <h1>Welcome, {{ username }}!</h1>

    <a href="{{ url_for('home') }}">Back to Home</a>

</body>

</html>
```

templates/submit.html
```
<!DOCTYPE html>

<html>

<head>

    <title>Submit Info</title>

    <style>

        body {

            font-family: Arial, sans-serif;

            background-color: #fff3e0;

            display: flex;

            justify-content: center;
```

```css
    align-items: center;

    height: 100vh;

}

.form-box {

    background: white;

    padding: 40px;

    border-radius: 10px;

    box-shadow: 0 0 12px rgba(0,0,0,0.1);

    width: 300px;

    text-align: center;

}

input {

    width: 100%;

    padding: 10px;

    margin-top: 12px;

    border: 1px solid #ccc;

    border-radius: 6px;

}

button {

    margin-top: 20px;

    padding: 10px;

    width: 100%;

    background-color: #fb8c00;

    color: white;
```

```
      border: none;

      border-radius: 6px;

    }

    button:hover {

      background-color: #ef6c00;

    }

    .message {

      font-size: 18px;

      color: #424242;

    }

    a {

      display: block;

      margin-top: 20px;

      text-decoration: none;

      color: #fb8c00;

    }

  </style>

</head>

<body>

  <div class="form-box">

    {% if submitted %}

      <h2 class="message">Thank you, {{ name }}!</h2>

      <p class="message">We received your age as {{ age }}.</p>

      <a href="{{ url_for('home') }}">Back to Home</a>
```
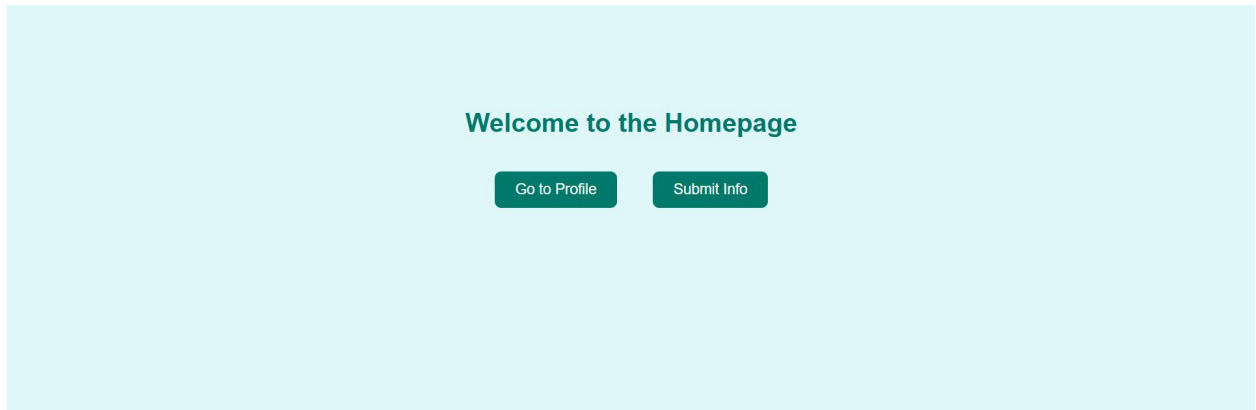
```
    {% else %}

        <h2>Submit Your Info</h2>

        <form method="POST">

            <input type="text" name="name" placeholder="Your Name" required>

            <input type="number" name="age" placeholder="Your Age" required>

            <button type="submit">Submit</button>

        </form>

        <a href="{{ url_for('home') }}">Back to Home</a>

    {% endif %}

    </div>

</body>

</html>
```

OUTPUT

Welcome to the Homepage

[Go to Profile] [Submit Info]

Welcome, Guest!

Back to Home

Submit Your Info

arnav

21

Submit

Back to Home

Thank you, arnav!

We received your age as 21.

Back to Home