

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:

```
python
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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:

```
python
CopyEdit
@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:

```
python
CopyEdit
@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:

```
python
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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:

```
python
CopyEdit
@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()`**

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

2. **Using Environment Variables**

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

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

On Windows (Command Prompt):

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

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

OUTPUT:-

App.py

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

app = Flask(__name__)

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

@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['username'] # Change 'name' to 'username'
        age = request.form['age']
        return redirect(url_for('confirmation', name=name, age=age))
    return render_template('submit.html')

@app.route('/confirmation')
def confirmation():
    name = request.args.get('name')
    age = request.args.get('age')
    return render_template('confirmation.html', name=name, age=age)

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

Templates/home.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <title>Homepage | Flask App</title>
    <link rel="stylesheet"
    href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.0/dist/css/bootstrap.min.css">
    <style>
        body {
            background: linear-gradient(to right, #0f207, #203a43, #2c5364);
            height: 100vh;
            display: flex;
```

```
        align-items: center;
        justify-content: center;
        text-align: center;
        color: white;
        font-family: 'Poppins', sans-serif;
    }
.container {
    max-width: 500px;
    background: rgba(255, 255, 255, 0.1);
    padding: 30px;
    border-radius: 15px;
    box-shadow: 0px 4px 15px rgba(0, 0, 0, 0.2);
    backdrop-filter: blur(10px);
}
h1 {
    font-size: 2.5rem;
    font-weight: bold;
    margin-bottom: 15px;
}
.btn-custom {
    background-color: rgba(255, 255, 255, 0.3);
    border: none;
    color: white;
    padding: 12px 25px;
    font-size: 18px;
    border-radius: 8px;
    transition: 0.3s ease-in-out;
    text-decoration: none;
    display: inline-block;
    margin: 10px;
}
.btn-custom:hover {
    background-color: rgba(255, 255, 255, 0.5);
    color: #203a43;
}
</style>
</head>
<body>
    <div class="container">
        <h1>Welcome to the Flask App</h1>
        <a href="{{ url_for('profile', username='Guest') }}" class="btn-custom">Go to Profile</a>
        <a href="{{ url_for('submit') }}" class="btn-custom">Go to Submit Page</a>
    </div>
</body>
</html>
```

Templates/profile.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <title>Profile Page</title>
    <link rel="stylesheet"
    href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.0/dist/css/bootstrap.min.css">
    <style>
        body {
            background: linear-gradient(to right, #1e3c72, #2a5298);
            height: 100vh;
            display: flex;
            align-items: center;
            justify-content: center;
            text-align: center;
            color: white;
            font-family: 'Poppins', sans-serif;
        }
        .profile-card {
            background: rgba(255, 255, 255, 0.1);
            padding: 30px;
            border-radius: 15px;
            box-shadow: 0px 4px 15px rgba(0, 0, 0, 0.2);
            backdrop-filter: blur(10px);
            width: 350px;
        }
        .profile-image {
            width: 100px;
            height: 100px;
            border-radius: 50%;
            object-fit: cover;
            border: 3px solid white;
            margin-bottom: 15px;
        }
        h1 {
            font-size: 2rem;
            font-weight: bold;
            margin-bottom: 10px;
        }
        p {
            font-size: 1.2rem;
            margin-bottom: 5px;
        }
        .btn-custom {
            background-color: white;
            color: #2a5298;
            font-weight: bold;
            padding: 10px 15px;
        }
    </style>

```

```

        border-radius: 8px;
        text-decoration: none;
        display: inline-block;
        transition: 0.3s ease-in-out;
    }
    .btn-custom:hover {
        background-color: #f8f9fa;
        color: #1e3c72;
    }
</style>
</head>
<body>
    <div class="profile-card">
        
        <h1>{{ username }}</h1>
        <p><strong>Age:</strong> {{ age if age else 'Unknown' }}</p>
        <a href="{{ url_for('home') }}" class="btn-custom mt-3">Back to Home</a>
    </div>
</body>
</html>

```

Templates/submit.html

```

<!DOCTYPE html>
<html lang="en">
<head>
    <title>Submit Details</title>
    <link rel="stylesheet"
    href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.0/dist/css/bootstrap.min.css">
    <style>
        body {
            background: linear-gradient(to right, #141e30, #243b55);
            height: 100vh;
            display: flex;
            align-items: center;
            justify-content: center;
            text-align: center;
            color: white;
            font-family: 'Poppins', sans-serif;
        }
        .form-container {
            max-width: 400px;
            background: rgba(255, 255, 255, 0.1);
            padding: 30px;
            border-radius: 15px;
            box-shadow: 0px 4px 15px rgba(0, 0, 0, 0.3);
        }
    </style>
</head>
<body>
    <div class="form-container">
        <h2>Submit Details</h2>
        <form>
            <div>
                <label>Name <input type="text" name="name" /></label>
            </div>
            <div>
                <label>Age <input type="number" name="age" /></label>
            </div>
            <div>
                <label>Gender <input type="radio" name="gender" value="male"/> Male <input type="radio" name="gender" value="female"/> Female <input type="radio" name="gender" value="other"/> Other
            </label>
            </div>
            <div>
                <label>Address <input type="text" name="address" /></label>
            </div>
            <div>
                <label>City <input type="text" name="city" /></label>
            </div>
            <div>
                <label>State <input type="text" name="state" /></label>
            </div>
            <div>
                <label>Country <input type="text" name="country" /></label>
            </div>
            <div>
                <label>Phone Number <input type="text" name="phone" /></label>
            </div>
            <div>
                <label>Email <input type="text" name="email" /></label>
            </div>
            <div>
                <label>Password <input type="password" name="password" /></label>
            </div>
            <div>
                <label>Confirm Password <input type="password" name="confirm_password" /></label>
            </div>
            <div>
                <button type="submit" class="btn btn-primary">Submit</button>
            </div>
        </form>
    </div>
</body>

```

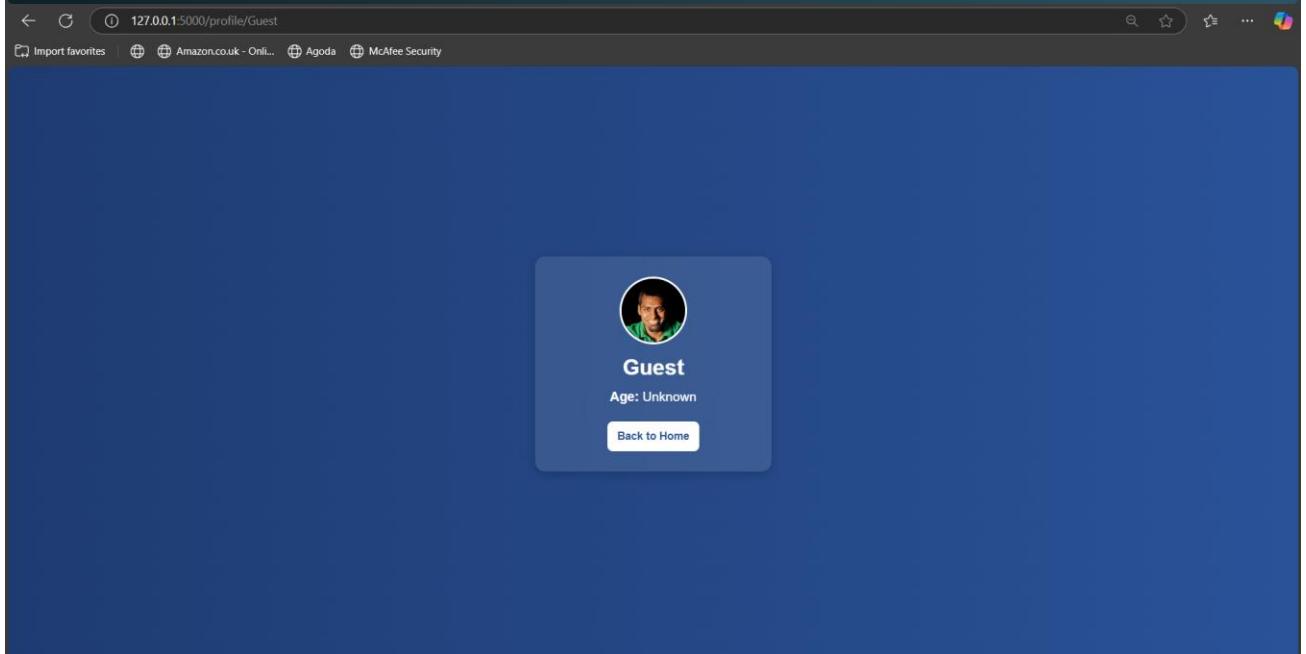
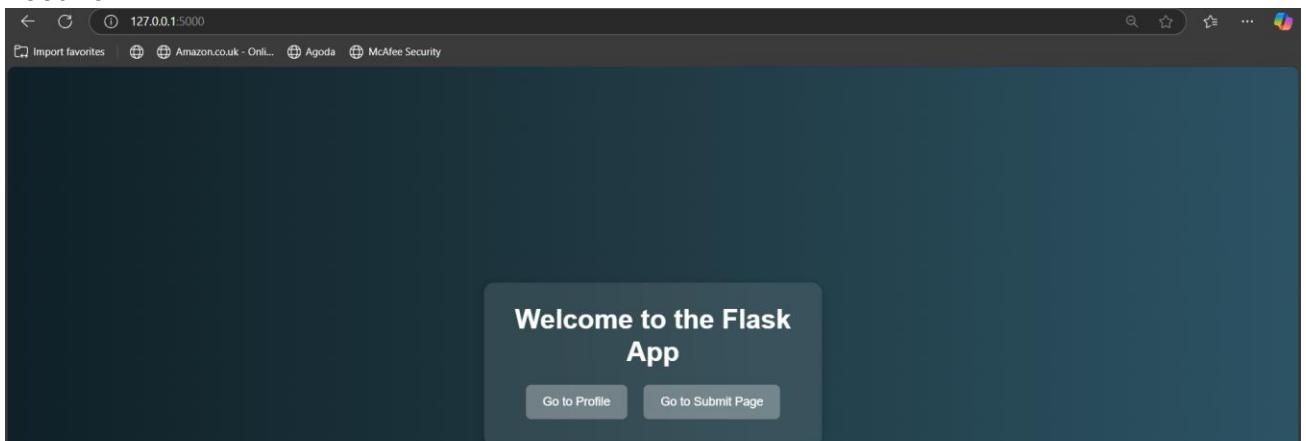
```
        backdrop-filter: blur(10px);
    }
    input, button {
        width: 100%;
        padding: 10px;
        margin-top: 10px;
        border: none;
        border-radius: 8px;
    }
    input {
        background: rgba(255, 255, 255, 0.2);
        color: white;
        outline: none;
    }
    input::placeholder {
        color: rgba(255, 255, 255, 0.7);
    }
    button {
        background-color: rgba(255, 255, 255, 0.3);
        color: white;
        font-weight: bold;
        transition: 0.3s ease-in-out;
    }
    button:hover {
        background-color: rgba(255, 255, 255, 0.6);
        color: #243b55;
    }
</style>
</head>
<body>
<div class="form-container">
    <h1>Submit Your Details</h1>
    <form action="{{ url_for('submit') }}" method="POST">
        <input type="text" name="username" placeholder="Enter your name"
required>
        <input type="number" name="age" placeholder="Enter your age" required>
        <button type="submit">Submit</button>
    </form>
</div>
</body>
</html>
```

Templates/confirmation.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <title>Submission Successful</title>
    <link rel="stylesheet"
    href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.0/dist/css/bootstrap.min.css">
    <style>
        body {
            background: linear-gradient(to right, #00c6ff, #0072ff);
            height: 100vh;
            display: flex;
            align-items: center;
            justify-content: center;
            text-align: center;
            color: white;
            font-family: 'Poppins', sans-serif;
        }
        .confirmation-box {
            max-width: 450px;
            background: rgba(255, 255, 255, 0.1);
            padding: 30px;
            border-radius: 15px;
            box-shadow: 0px 4px 15px rgba(0, 0, 0, 0.3);
            backdrop-filter: blur(10px);
        }
        h1 {
            font-size: 2rem;
            font-weight: bold;
            white-space: nowrap; /* Ensures text stays on a single line */
        }
        p {
            font-size: 1.2rem;
        }
        .btn-custom {
            background-color: rgba(255, 255, 255, 0.3);
            color: white;
            padding: 10px 20px;
            font-size: 16px;
            border-radius: 8px;
            text-decoration: none;
            transition: 0.3s ease-in-out;
            display: inline-block;
        }
        .btn-custom:hover {
            background-color: rgba(255, 255, 255, 0.6);
            color: #0072ff;
        }
    </style>
```

```
</head>
<body>
  <div class="confirmation-box">
    <h1>Submission Successful! 🎉</h1>
    <p><strong>Name:</strong> {{ name }}</p>
    <p><strong>Age:</strong> {{ age }}</p>
    <a href="{{ url_for('home') }}" class="btn-custom mt-3">Back to Home</a>
  </div>
</body>
</html>
```

Result-



The image contains two screenshots of a web application interface. The top screenshot shows a 'Submit Your Details' form with a dark blue header and a light gray body. It has two input fields: one for 'Name' containing 'Laksh Sodhai' and another for 'Age' containing '21'. A 'Submit' button is at the bottom. The bottom screenshot shows a 'Submission Successful!' message with a light blue background. It displays the submitted 'Name: Laksh Sodhai' and 'Age: 21'. A 'Back to Home' button is at the bottom.

```
PS C:\Users\laksh\OneDrive\Desktop\ff> python app.py
 * Serving Flask app 'app'
 * Debug mode: on
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
 * Running on http://127.0.0.1:5000
Press CTRL+C to quit
 * Restarting with stat
 * Debugger is active!
 * Debugger PIN: 126-116-015
127.0.0.1 - - [27/Mar/2025 01:23:46] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [27/Mar/2025 01:23:48] "GET /profile/Guest HTTP/1.1" 200 -
127.0.0.1 - - [27/Mar/2025 01:23:50] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [27/Mar/2025 01:23:51] "GET /submit HTTP/1.1" 200 -
127.0.0.1 - - [27/Mar/2025 01:23:54] "POST /submit HTTP/1.1" 302 -
127.0.0.1 - - [27/Mar/2025 01:23:54] "GET /confirmation?name=Laksh+Sodhai&age=21 HTTP/1.1" 200 -
```