Experiment - 5: Flask Application

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Aim : To create a Flask application that demonstrates template rendering by dynamically generating HTML content using the render_template()function.

Problem statement :

Develop a Flask application that includes:

1. A homepage route (/) displaying a welcome message with links to additional pages.
2. A dynamic route (/user/<username>) that renders an HTML template with a personalized greeting.
3. Use Jinja2 templating features, such as variables and control structures, to enhance the templates.

Theory :

1. **What does the render_template()function do in a Flask application?**

   The render_template() function is used to render HTML templates stored in the templates folder. It dynamically generates web pages by passing variables from the Flask app to the template using Jinja2.

2. **What is the significance of the templates folder in a Flask project?**

   - The templates folder is the default location where Flask looks for HTML files.
   - It maintains a clean separation between business logic (Python code) and presentation logic (HTML).
   - Using the templates folder allows developers to use Jinja2 for rendering dynamic content.

- The folder can also store reusable components like base templates, headers, or footers using template inheritance.

3. **What is Jinja2, and how does it integrate with Flask?**

Jinja2 is a templating engine used in Flask to render dynamic HTML content. It allows embedding Python expressions inside HTML files. Using Jinja2, you can:

- Display variables
- Apply logic (like loops and conditionals)
- Apply filters for formatting

Flask integrates Jinja2 by default using the render_template()function.

OUTPUT

- **app.py**

```
from flask import Flask, render_template

app = Flask(__name__)

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

@app.route('/user/<username>')
def user_profile(username):
    return render_template('user.html', username=username)

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

- **base.html**

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>{% block title %}Flask WebApp{% endblock %}</title>
    <link                                                    rel="stylesheet"
     href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.0/dist/css/bootstrap.min.css"
     >
    <link rel="stylesheet" href="{{ url_for('static', filename='styles.css') }}">
```

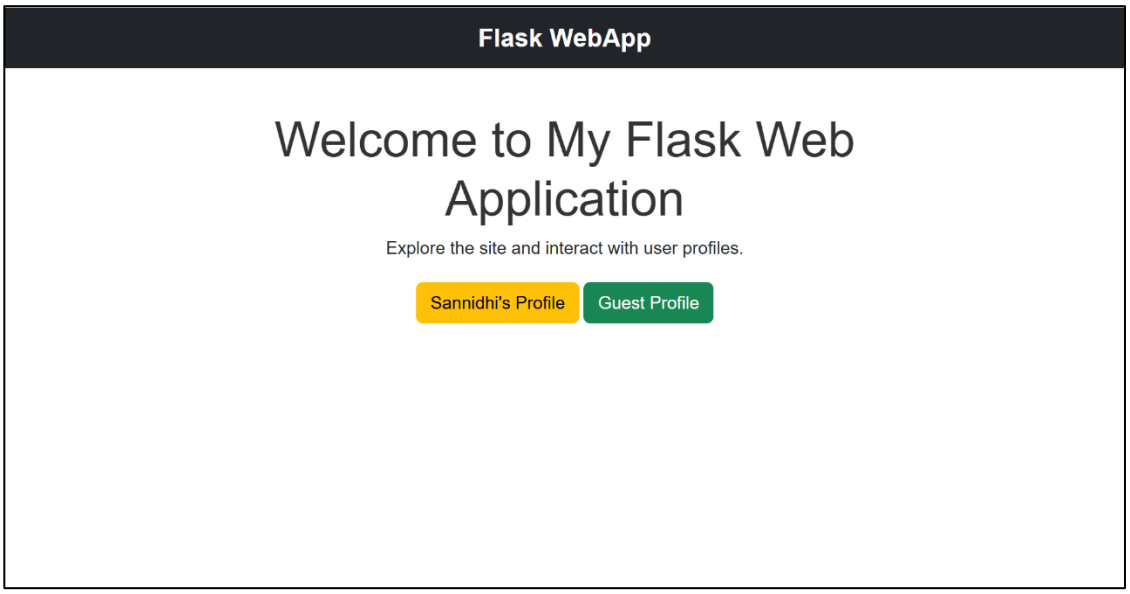
```
</head>
<body>
    <nav class="navbar navbar-dark bg-dark">
        <div class="container">
            <a class="navbar-brand mx-auto" href="/">Flask WebApp</a>
        </div>
    </nav>

    <div class="container mt-5">
        {% block content %}{% endblock %}
    </div>


</body>
     </html>
```

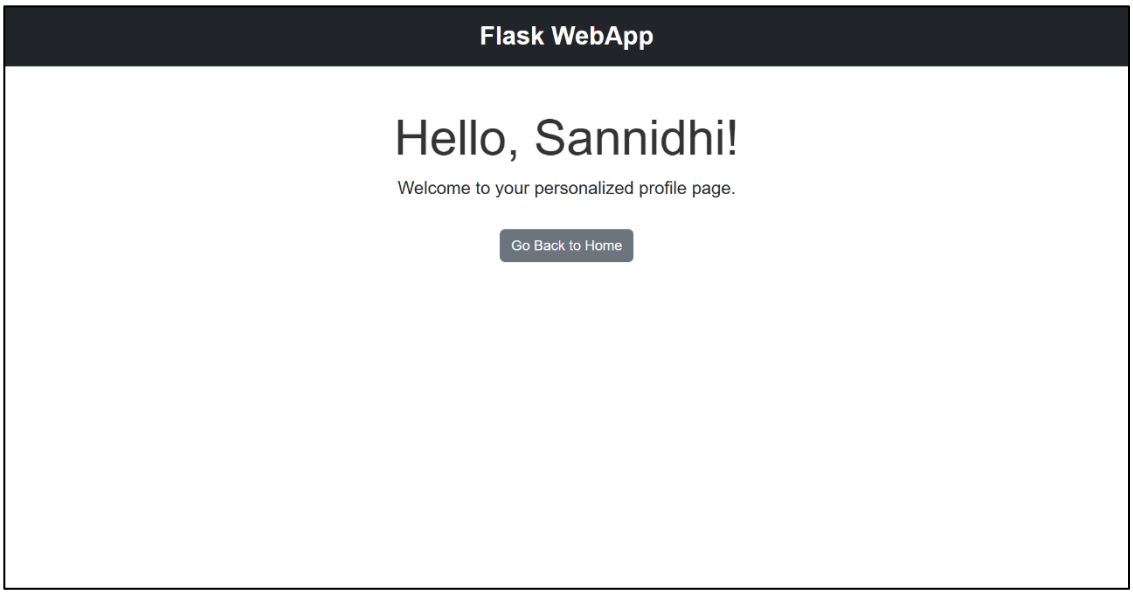
- **home.html**

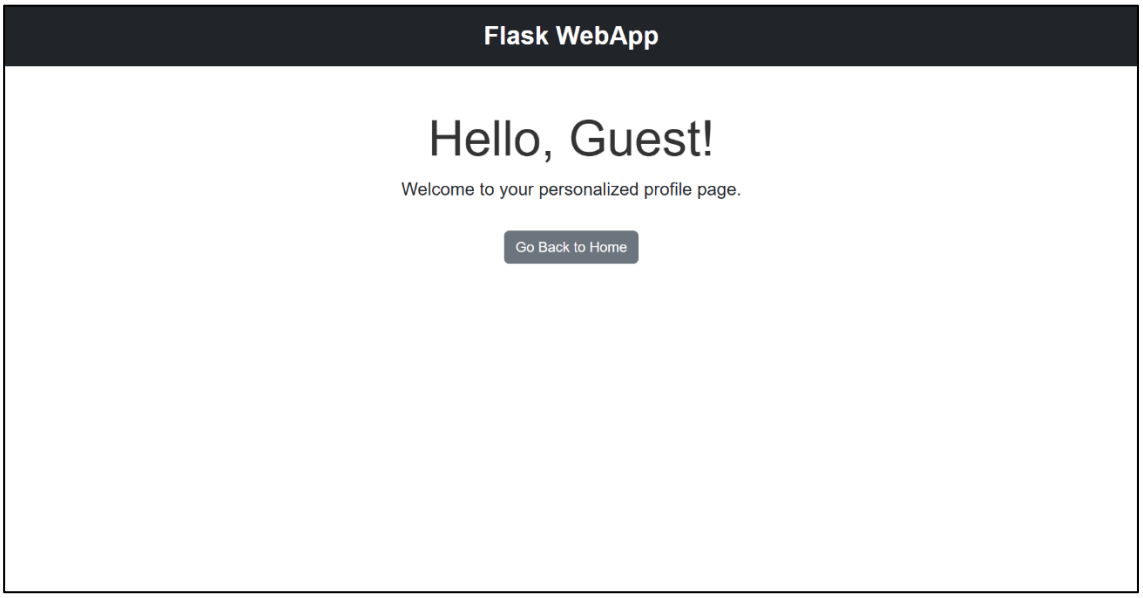
```
{% extends 'base.html' %}

{% block title %}Home - Flask WebApp{% endblock %}

{% block content %}
<div class="text-center">
    <h1 class="display-4">Welcome to My Flask Web Application</h1>
    <p class="lead">Explore the site and interact with user profiles.</p>

    <div class="mt-4">
        <a href="/user/Sannidhi" class="btn btn-warning btn-lg">Sannidhi's
     Profile</a>
        <a href="/user/Guest" class="btn btn-success btn-lg">Guest Profile</a>
    </div>
</div>
     {% endblock %}
```

- **user.html**

```
{% extends 'base.html' %}

{% block title %}Profile - {{ username }}{% endblock %}

{% block content %}
<div class="text-center">
    <h1 class="display-4">Hello, {{ username }}!</h1>
    <p class="lead">Welcome to your personalized profile page.</p>
    <a href="/" class="btn btn-secondary mt-3">Go Back to Home</a>
</div>
     {% endblock %}
```


Flask WebApp
Welcome to My Flask Web Application
Explore the site and interact with user profiles.
Sannidhi's Profile
Guest Profile


Flask WebApp
Hello, Sannidhi!
Welcome to your personalized profile page.
Go Back to Home


Flask WebApp
Hello, Guest!
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