EXPERIMENT NO.3 : Flask

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Aim: To develop a basic Flask application with multiple routes and demonstrate the handling of GET and POST requests.

Problem Statement :

Design a Flask web application with the following features:

1. A homepage (/) that provides a welcome message and a link to a contact form.
    a. Create routes for the homepage (/), contact form (/contact), and thank-you page (/thank_you).
2. A contact page (/contact) where users can fill out a form with their name and email.
3. Handle the form submission using the POST method and display the submitted data on a thank-you page (/thank_you).
    a. On the contact page, create a form to accept user details (name and email).
    b. Use the POST method to handle form submission and pass data to the thank-you page
4. Demonstrate the use of GET requests by showing a dynamic welcome message on the homepage when the user accesses it with a query parameter, e.g., /welcome?name=<user_name>.
    a. On the homepage (/), use a query parameter (name) to display a personalized welcome message.

Github Link :

https://github.com/KomalDeolekar0607/Webx_Lab/tree/main/Webx_Lab_Exp_3

Theory:

A. List some of the core features of Flask

- **Lightweight & Micro-framework** – Flask is minimalistic and does not include built-in tools like ORM or authentication.

- **Built-in Development Server** – Provides debugging support with an interactive debugger
- **Jinja2 Templating Engine** – Allows dynamic content rendering in HTML templates.
- **Routing** – Supports URL routing to map URLs to functions.
- **WSGI Support** – Works with WSGI (Web Server Gateway Interface) for better request handling.
- **RESTful Support** – Provides built-in support for creating RESTful APIs.
- **Extensibility** – Can integrate third-party libraries like Flask-SQLAlchemy and Flask-Login.
- **Session Management** – Supports secure client-side sessions using cookies.

B. Why do we use Flask(__name__) in Flask?

- Flask(__name__) initializes a Flask application with the name of the current module.
- It helps Flask locate resources like templates, static files, and configurations.
- It ensures that Flask knows the application's context for proper URL routing and debugging.

C. What is Template (Template Inheritance) in Flask?

- **Templates** in Flask use **Jinja2**, which allows embedding Python logic inside HTML files.
- **Template Inheritance** lets developers create a base template (base.html) with common layout elements (e.g., header, footer).
- Other templates (child.html) extend base.html using {% block content %}...{% endblock %} to define specific page content.
- This helps in maintaining **clean, reusable, and scalable** HTML structures.

D. What methods of HTTP are implemented in Flask.

- **GET** – Retrieves data from the server.
- **POST** – Sends data to the server (e.g., form submission).
- **PUT** – Updates existing resources.
- **DELETE** – Removes resources.
- **PATCH** – Partially updates resources.
- **HEAD** – Retrieves only headers, not the response body.
- **OPTIONS** – Returns allowed HTTP methods for a given URL.

E. What is difference between Flask and Django framework

Feature	Flask	Django
Routing	Manual, flexible with `@app.route()`	Automatic, uses `urls.py` for URL mapping
URL Building	Uses `url_for('function_name')`	Uses `reverse('app_name:view_name')`
GET Request	`request.args.get('key')`	Uses `request.GET['key']`
POST Request	`request.form['key']`	Uses `request.POST['key']`

Flask is more **lightweight** and allows developers to structure applications **freely**.

Django is more **feature-rich**, following a **"batteries-included"** approach.

Flask is ideal for **small to medium** projects, while Django is better for **large-scale** applications.

Routing

In Flask, routing refers to the process of mapping a URL to a specific function in your application. Routes determine how your app responds to different URL paths accessed by users.

Example:

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

This code maps the / URL to the home() function, so when a user visits the root URL, the function is triggered.

URL building

URL building in Flask allows you to dynamically generate URLs using the url_for() function. It's useful when you want to avoid hardcoding URLs and keep your app flexible and maintainable.

Example:

```
@app.route('/about')
def about():
```

```
    return "About Page"


@app.route('/')
def home():
    return f'<a href="{url_for("about")}">Go to About</a>'
```

url_for("about") automatically builds the URL for the about route.

GET REQUEST

A GET request is used to retrieve data from the server. It's the default HTTP method when you open a URL in a browser. Query parameters can be passed in the URL for dynamic responses.

Example:

```
@app.route('/welcome')
def welcome():
    name = request.args.get('name', 'Guest')
    return f"Welcome, {name}!"
```

If the user visits /welcome?name=Komal, the page will display "Welcome, Komal!".

POST REQUEST

A POST request is used to submit data to the server, often through a form. It is more secure for sending sensitive data and does not show the information in the URL.

Example:

```
@app.route('/submit', methods=['GET', 'POST'])
def submit():
    if request.method == 'POST':
```

```
        name = request.form['name']
        return f'Thank you, {name}!'
    return '''
        <form method="post">
            Name: <input type="text" name="name">
            <input type="submit">
        </form>
    '''
```

Here, the form accepts a name and sends it via POST. The server then displays a thank-you message.

Code :

app.py

```
from flask import Flask, render_template, request
app = Flask(__name__)
# @app.route('/', methods=['GET', 'POST'])
@app.route('/', methods=['GET'])
def home():
    # name = request.form.get('name', 'Guest')  # Get name from form input
    name = request.args.get('name', 'Guest')  # Get name from form input

    return f'''
        <html>
        <head>
            <title>Flask App</title>
            <style>
                body {{
                    font-family: Arial, sans-serif;
                    text-align: center;
                    margin: 50px;
                    background-color: #f4f4f4;
                }}
                h1 {{
                    color: #333;
                }}
                form {{
                    margin-top: 20px;
                }}
                input, button {{
```

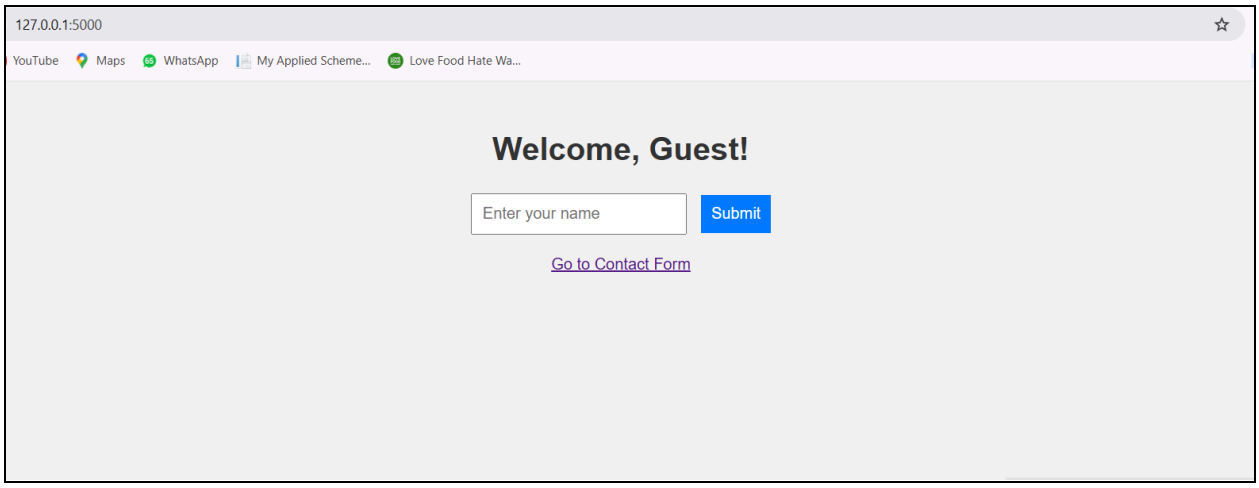
```
            padding: 10px;
            font-size: 16px;
            margin: 5px;
        }}
        button {{
            background-color: #007BFF;
            color: white;
            border: none;
            cursor: pointer;
        }}
        button:hover {{
            background-color: #0056b3;
        }}
    </style>
</head>
<body>
    <h1>Welcome, {name}!</h1>
    <form method="get">
        <input type="text" name="name" placeholder="Enter your name" required>
        <button type="submit">Submit</button>
    </form>
    <p><a href="/contact">Go to Contact Form</a></p>
</body>
</html>
'''

@app.route('/contact', methods=['GET', 'POST'])
def contact():
    if request.method == 'POST':
        name = request.form.get('name')
        email = request.form.get('email')
        return f"""
<html>
    <head>
        <title>Thank You</title>
        <style>
            body {{ font-family: Arial, sans-serif; text-align: center; margin: 50px; }}
            h1 {{ color: #28a745; }}
            a {{ text-decoration: none; color: #007BFF; }}
            a:hover {{ color: #0056b3; }}
        </style>
    </head>
    <body>
        <h1>Thank You, {name}!</h1>
        <p>Your email: {email}</p>
        <a href="/">Back to Home</a>
    </body>
</html>
"""

    return """
    <html>
    <head>
        <title>Contact Us</title>
        <style>
            body { font-family: Arial, sans-serif; text-align: center; margin: 50px; background-color: #f4f4f4; }
```

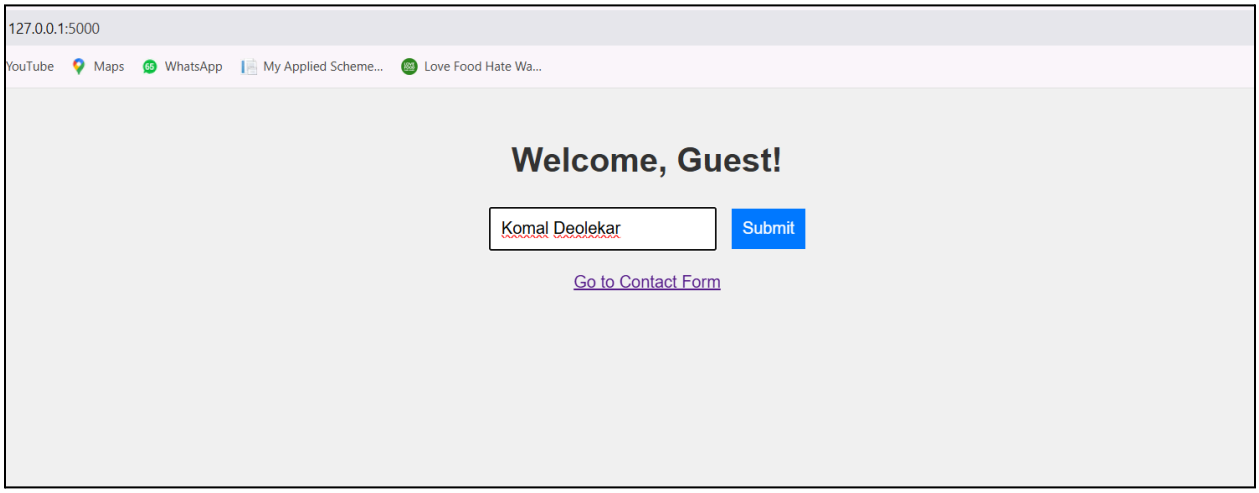
```
            form { margin-top: 20px; }
            input, button { padding: 10px; font-size: 16px; margin: 5px; }
            button { background-color: #28a745; color: white; border: none; cursor: pointer; }
            button:hover { background-color: #218838; }
        </style>
    </head>
    <body>
        <h1>Contact Us</h1>
        <form method="post">
            <input type="text" name="name" placeholder="Your Name" required><br>
            <input type="email" name="email" placeholder="Your Email" required><br>
            <button type="submit">Submit</button>
        </form>
        <p><a href="/">Back to Home</a></p>
    </body>
    </html>
    """
if __name__ == '__main__':
    app.run(debug=True)
```

Output :

```
D:\Users\Komal\OneDrive\Desktop\sem 6\webx_lab\flask_lab_3>py --version
Python 3.13.2

D:\Users\Komal\OneDrive\Desktop\sem 6\webx_lab\flask_lab_3>py -m venv venv

D:\Users\Komal\OneDrive\Desktop\sem 6\webx_lab\flask_lab_3>
D:\Users\Komal\OneDrive\Desktop\sem 6\webx_lab\flask_lab_3>venv\Scripts\activate

(venv) D:\Users\Komal\OneDrive\Desktop\sem 6\webx_lab\flask_lab_3>
```

```
(venv) D:\Users\Komal\OneDrive\Desktop\sem 6\webx_lab\flask_lab_3>pip install flask
Collecting flask
  Downloading flask-3.1.0-py3-none-any.whl.metadata (2.7 kB)
Collecting Werkzeug>=3.1 (from flask)
  Downloading werkzeug-3.1.3-py3-none-any.whl.metadata (3.7 kB)
Collecting Jinja2>=3.1.2 (from flask)
  Downloading jinja2-3.1.6-py3-none-any.whl.metadata (2.9 kB)
Collecting itsdangerous>=2.2 (from flask)
  Downloading itsdangerous-2.2.0-py3-none-any.whl.metadata (1.9 kB)
Collecting click>=8.1.3 (from flask)
  Downloading click-8.1.8-py3-none-any.whl.metadata (2.3 kB)
Collecting blinker>=1.9 (from flask)
  Downloading blinker-1.9.0-py3-none-any.whl.metadata (1.6 kB)
Collecting colorama (from click>=8.1.3->flask)
  Downloading colorama-0.4.6-py2.py3-none-any.whl.metadata (17 kB)
Collecting MarkupSafe>=2.0 (from Jinja2>=3.1.2->flask)
```


127.0.0.1:5000
YouTube
Maps
WhatsApp
My Applied Scheme...
Love Food Hate Wa...
Welcome, Guest!
Enter your name
Submit
Go to Contact Form


127.0.0.1:5000
YouTube
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My Applied Scheme...
Love Food Hate Wa...
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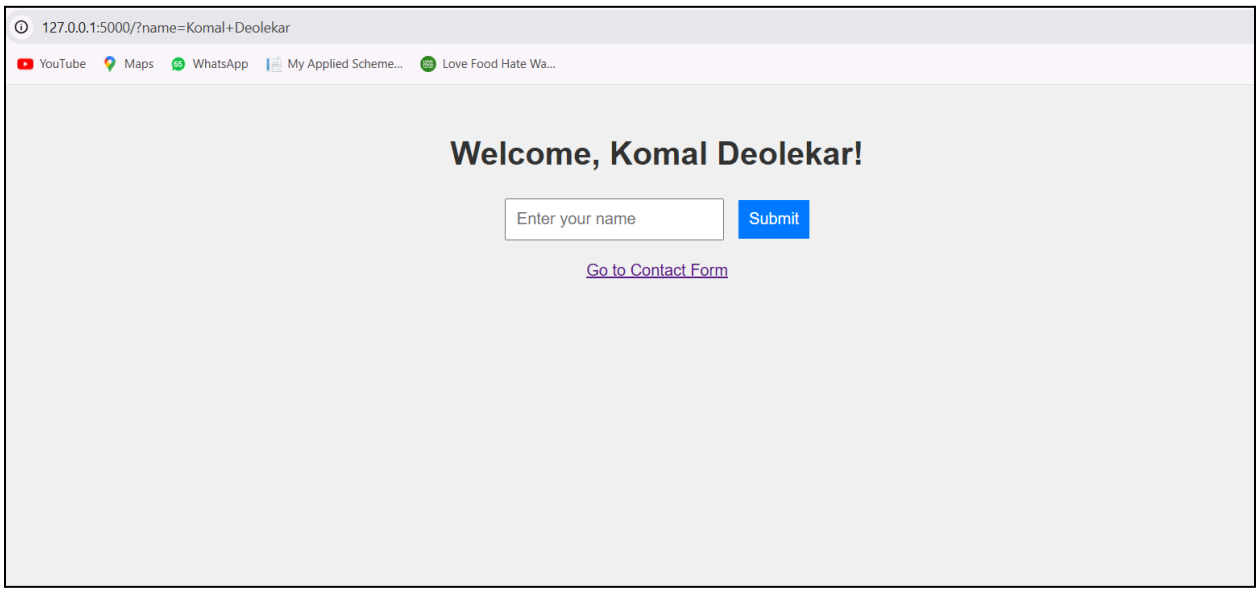
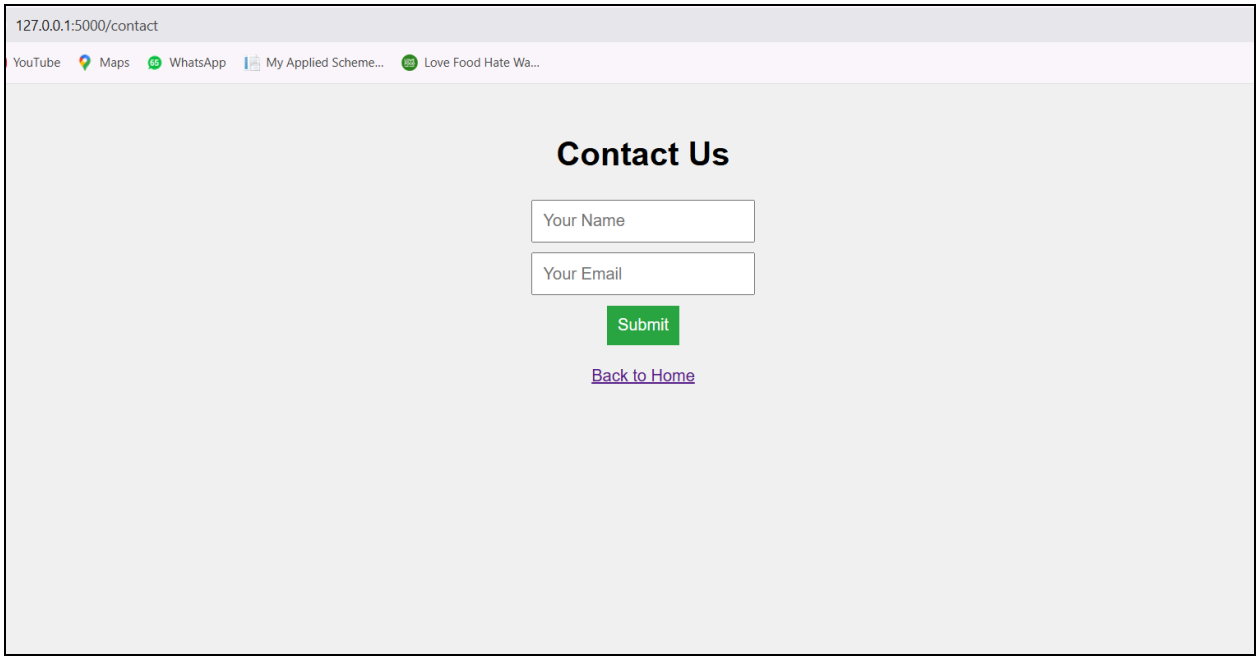
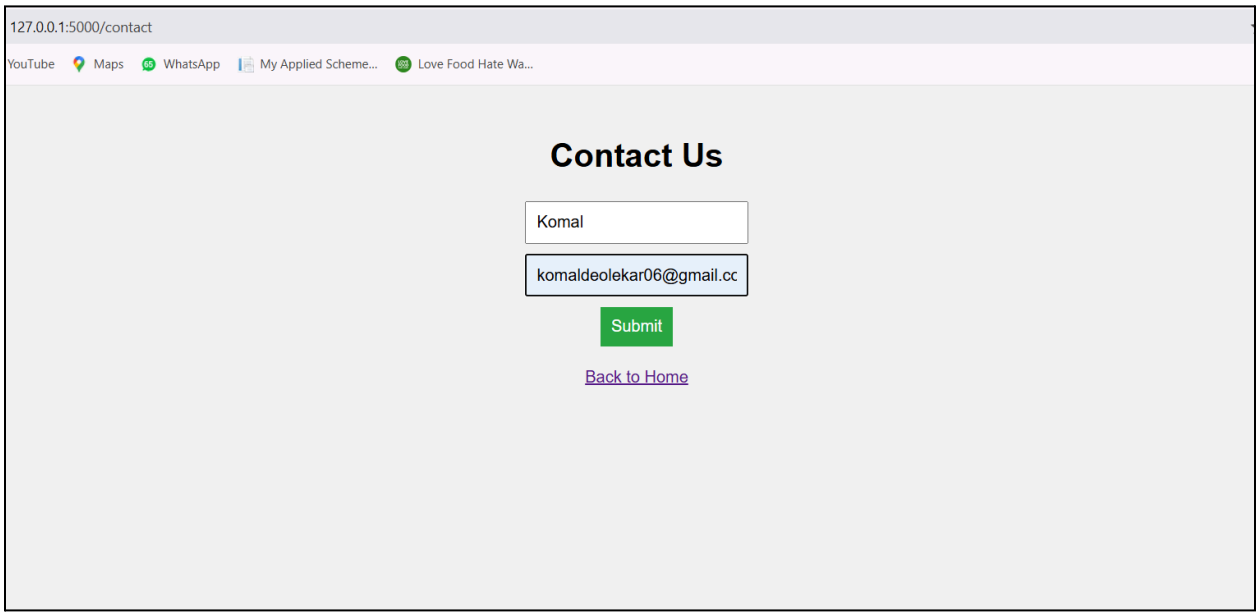
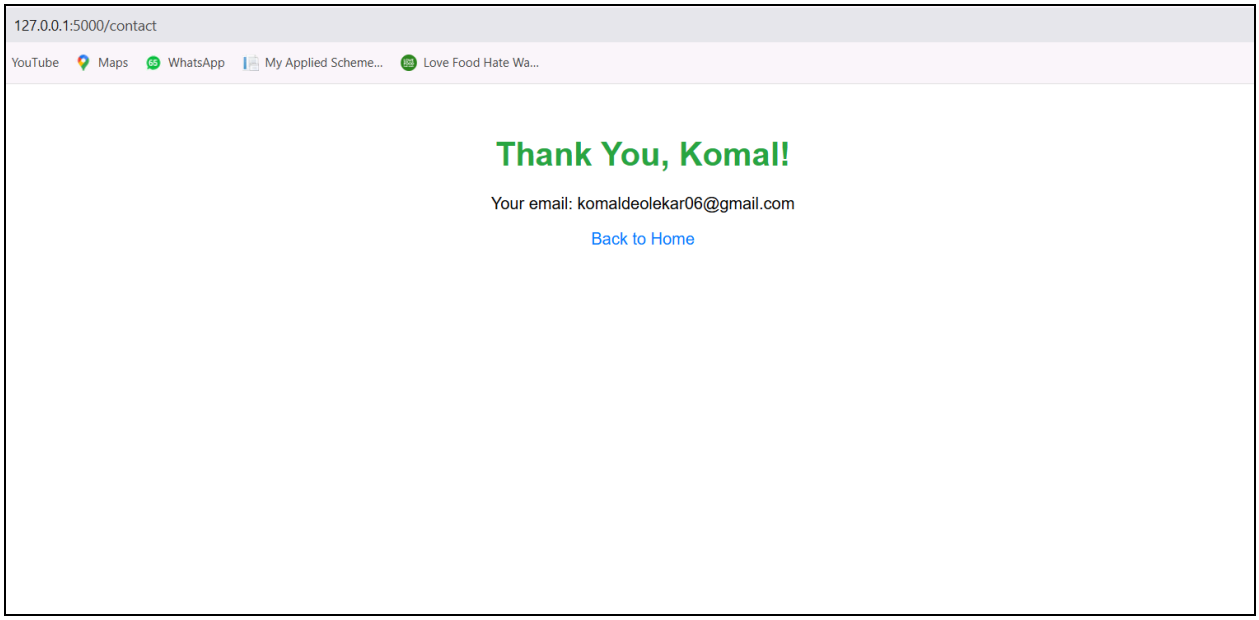
Go to Contact Form


127.0.0.1:5000/?name=Komal+Deolekar
YouTube
Maps
WhatsApp
My Applied Scheme...
Love Food Hate Wa...
Welcome, Komal Deolekar!
Enter your name
Submit
Go to Contact Form


127.0.0.1:5000/contact
YouTube
Maps
WhatsApp
My Applied Scheme...
Love Food Hate Wa...
Contact Us
Your Name
Your Email
Submit
Back to Home


127.0.0.1:5000/contact
YouTube
Maps
WhatsApp
My Applied Scheme...
Love Food Hate Wa...
Contact Us
Komal
komaldeolekar06@gmail.cc
Submit
Back to Home



Conclusion :

In this Flask application, we successfully implemented multiple routes to handle both GET and POST requests, demonstrating the fundamental workings of a web application.

1. Dynamic GET Request Handling:
    - The homepage (/) dynamically greets users when accessed with a query parameter, e.g., /welcome?name=Komal, enhancing user experience with personalized messages.
2. Form Handling with POST Request:
    - The contact form (/contact) accepts user inputs (name and email) and submits data via the POST method.
    - The submitted details are then displayed on the thank-you page (/thank_you), confirming the correct data transfer.
3. Routing and Page Navigation:
    - We designed separate routes for the homepage, contact form, and thank-you page, ensuring smooth navigation within the application.

This project effectively demonstrates how Flask handles HTTP methods, form submissions, and dynamic query parameters, forming the basis of real-world web applications.