Program No: 1

Problem statement:

A program that creates a simple web server and serves a static HTML page.

Aim:

To solve this problem statement.

Problem Description:

Develop a Python program using Flask to create a simple web server serving a static HTML page. The objective is to use the flask command (flask --app <YourAppName> run) instead of running the script directly. Ensure proper project organization, write a basic HTML file, and confirm functionality by accessing http://127.0.0.1:5000/ in a web browser.

Algorithm:

Step 1: start
Step 2: Install Flask
Step 3: create a Project Structure
Step 4: Write a HTML file and save as a index.html file
Step 5: Write a Flask file and save as a app.py file
Step 6: Run that Flask file.
Step 7: Stop

HTML FILE:

Index.html

```
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="UTF-8">
   <meta http-equiv="X-UA-Compatible" content="IE=edge">
   <meta name="viewport" content="width=device-width, initial-scale=1.0">
   <title>Static HTML Page</title>
</head>
<body>
   <h1>Hello, this is a static HTML page served by Flask!</h1>
```

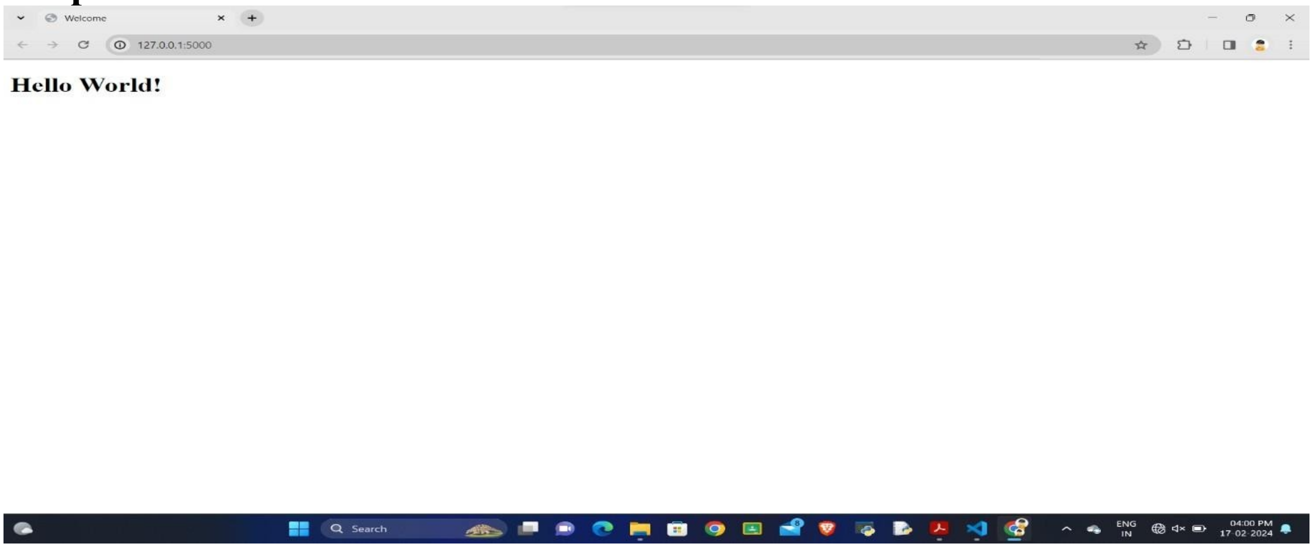
```
</body>
</html>
```

FLASK FILE:

app.py

```
from flask import Flask,
render_template app = Flask(_____name
_____________)
# Define a route for the root URL "/"
@app.route("/")
def home():
    # Render the static HTML page located in the "templates" folder
    return render_template("index.html")

# Run the app if this script is the main
program if__name_== "__main__":
    app.run(debug=True)
```

Output:



```
Hello World!
```

Conclusion:

Here We have successfully creates a simple web server and serves a static HTML page.

Program No: 2

Problem statement:

A program that creates a web application that allows users to register and login.

Aim:

To solve this problem statement.

Problem Description:

The web application will be built using a combination of front-end and back-end technologies. The front-end will be responsible for creating the user interface, while the back-end will handle user registration, login authentication, and data storage.

Algorithm:

Step 1: start
Step 2: create a Project Structure
Step 3: Write a HTML file and save as a index.html ,login.html & register.html file
Step 4: Write a Flask file and save as a app.py file
Step 5: Run that Flask file.
Step 6: Stop

HTML FILE:

Index.html

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <meta http-equiv="X-UA-Compatible" content="IE=edge" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>Static HTML Page</title>
  </head>
  <style>
  @import url("https://fonts.googleapis.com/css2?
family=Poppins:wght@500&display=sw ap");
  * {
    margin: 0;
    padding: 0;
    box-sizing: border-box;
  }
  body {
    height: 100vh;
    width: 100%;
    display: flex;
    justify-content: center;
    align-items: center;
    flex-direction:
    column; background:
    #ff5a5f;
  }
  h1 {
    font-family: "Poppins", sans-serif;
    color: #fff;
    margin: 30px
    50px; font-size:
    3rem;
  }
  input {
    padding: 10px 20px;
    border: 3px solid
    #fff; border-radius:
    10px;
    background: rgb(16, 208,
    16); font-size: 1.5rem;
    color: white;
    font-family: "Poppins", sans-
    serif; font-weight: 300;
    transition: .3s;
    &:hover{ backgr
    ound: #fff; color:
    #000; cursor:
    pointer;
      }
}
```

```
  </style>
  <body>
    <h1>Hello, this is a static HTML page served by Flask!</h1>
    <form action="{{ url_for('register') }}">
      <input type="submit" value="Register" />
    </form>
  </body>
</html>
```

login.html

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <meta http-equiv="X-UA-Compatible" content="IE=edge" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>User Login</title>
    <style>
      * {
        margin: 0;
        padding: 0;
        box-sizing: border-box;
      }
      body {
        height: 100vh;
        width: 100%;
        display: flex;
        align-items: center;
        justify-content: center;
        flex-direction:
        column;
        background: rgb(9, 9, 121);
        background: linear-gradient(
        30deg,
          rgba(9, 9, 121, 1) 0%,
          rgba(2, 0, 36, 1) 29%,
          rgba(0, 212, 255, 1) 100%
        );
      }
```

```
.container {
  display: flex;
  align-items: center;
  justify-content: space-
  evenly; flex-direction:
  column; width: 600px;
  border-radius:  20px;
  height:  500px;
  background: #ffffff5a;
  backdrop-filter:
  blur(20px); & h1 {
    font-family: Arial, Helvetica, sans-serif;
    color: #fff;
    margin: 30px 0;
  }
  & li {
    list-style: none;
  }
  & form {
    & label {
      color: white;
      font-family: Arial, Helvetica, sans-
      serif; font-size: 1.4rem;
      margin: 10px 20px;
    }
    & .log_button {
      color: #fff;
      background: red;
      border: none;
      outline: none;
      padding: 5px 10px;
      border-radius:
      10px; font-size:
      1.2rem; transition:
      0.3s;
      transform: translateX(130px);
      &:hover {
        background: #fff;
        color: #000;
        cursor: pointer;
```

```
            }
        }
        &  .password{ paddin
            g: 10px 20px;
            border-radius:
            20px; outline: none;
            border: none;
        }
        &  .username{ paddin
            g: 10px 20px;
            border-radius:
            20px; outline: none;
            border: none;
        }
        & input {
          margin: 10px 20px;
        }
        }
      }
      .error {
        color: red;
      }
      .success {
        color: green;
      }
      .default {
        color: black;
      }
    </style>
  </head>
  <body>
    <div class="container">
      <h1>User Login</h1>
      {% with messages = get_flashed_messages() %}  {% if messages %}
      <ul>
        {% for message in messages %}
        <li
          class="{% if 'error' in message %}error{% elif 'success' in message
%}success{% else %}default{% endif %}"
```

```
        >
          {{ message }}
        </li>
        {% endfor %}
      </ul>
      {% endif %} {% endwith %}
      <form method="post" action="{{ url_for('login') }}">
        <label for="username" class="username_label">Username:</label>
        <input type="text" name="username" class="username" required />
        <br />
        <label for="password" class="password_label">Password:</label>
        <input type="password" name="password" class="password" required />
        <br />
        <input type="submit" class="log_button" value="Log in" />
      </form>
      <p>
        Don't have an account?
        <a href="{{ url_for('register') }}">Register here</a>.
      </p>
    </div>
  </body>
</html>
```

register.html

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <meta http-equiv="X-UA-Compatible" content="IE=edge" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>User Registration</title>
    <style>
      * {
        margin: 0;
        padding: 0;
        box-sizing: border-box;
      }
      body {
```

```
  height: 100vh;
  width: 100%;
  display: flex;
  align-items: center;
  justify-content: center;
  flex-direction:
  column;
  background: rgb(9, 9, 121);
  background: linear-gradient(
  30deg,
    rgba(9, 9, 121, 1) 0%,
    rgba(2, 0, 36, 1) 29%,
    rgba(0, 212, 255, 1) 100%
  );
}
.container {
  display: flex;
  align-items: center;
  justify-content: space-
  evenly; flex-direction:
  column; width: 600px;
  border-radius:  20px;
  height:  500px;
  background: #ffffff5a;
  backdrop-filter:
  blur(20px); & h1 {
    font-family: Arial, Helvetica, sans-serif;
    color: #fff;
    margin: 30px 0;
  }
  & li {
    list-style: none;
  }
  & form {
    & label {
      color: white;
      font-family: Arial, Helvetica, sans-
      serif; font-size: 1.4rem;
      margin: 10px 20px;
    }
```

```
      & .register_button {
        color: #fff;
        background: red;
        border: none;
        outline: none;
        padding: 5px 10px;
        border-radius:
        10px; font-size:
        1.2rem; transition:
        0.3s;
        transform: translateX(130px);
        &:hover {
          background: #fff;
          color: #000;
          cursor: pointer;
        }
      }
      & .password {
        padding: 10px
        20px; border-
        radius: 20px;
        outline: none;
        border: none;
      }
      & .username {
        padding: 10px
        20px; border-
        radius: 20px;
        outline: none;
        border: none;
      }
      & input {
        margin: 10px 20px;
      }
    }
  }
  .error {
    color: red;
  }
  .success {
```

```
  color: green;
}
```

```
      .default {
        color: black;
      }
    </style>
  </head>
  <body>
    <div class="container">
      <h1>User Registration</h1>
      {% with messages = get_flashed_messages() %} {% if messages %}
      <ul>
        {% for message in messages %}
        <li
          class="{% if 'error' in message %}error{% elif 'success' in message
%}success{% else %}default{% endif %}"
        >
          {{ message }}
        </li>
        {% endfor %}
      </ul>
      {% endif %} {% endwith %}
      <form method="post" action="{{ url_for('register') }}">
        <label for="username" class="username_label">Username:</label>
        <input type="text" name="username" class="username" required />
        <br />
        <label for="password" class="password_label">Password:</label>
        <input type="password" name="password" class="password" required />
        <br />
        <input type="submit" class="register_button" value="Register" />
      </form>
      <p>
        Already have an account?
        <a href="{{ url_for('login') }}">Log in here</a>.
      </p>
    </div>
  </body>
</html>
```

FLASK FILE:

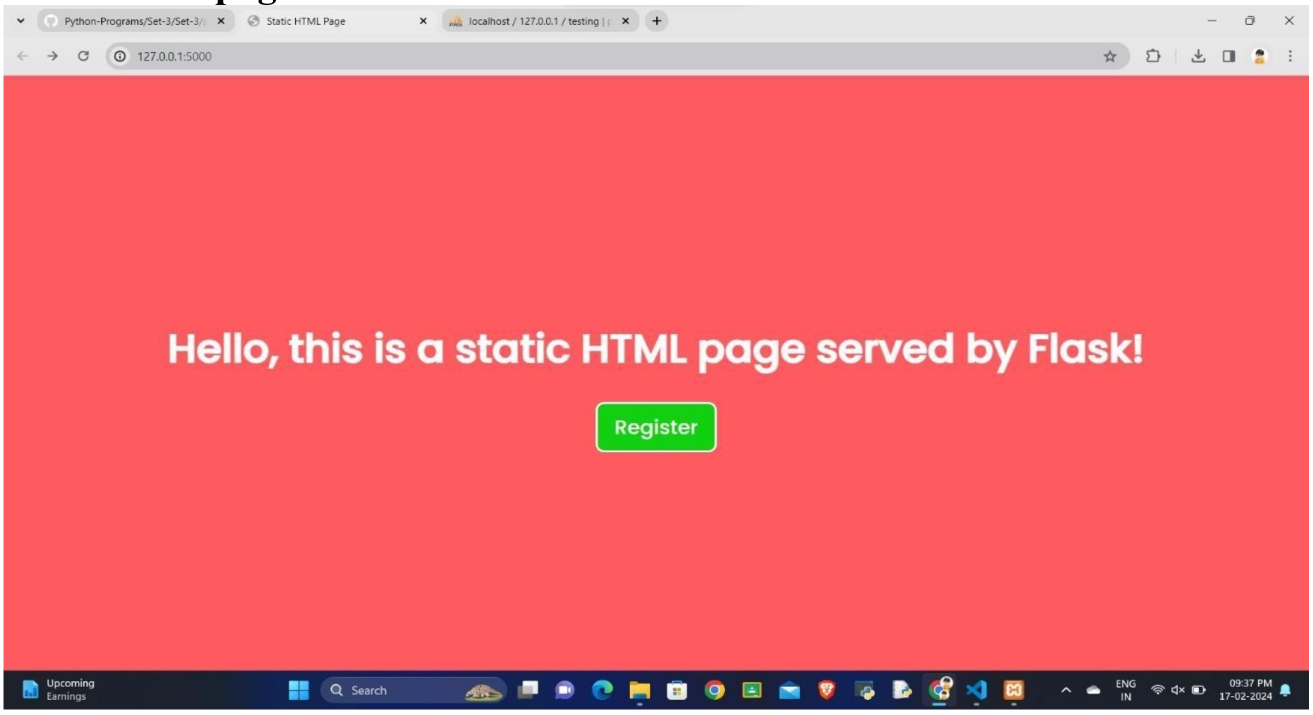
app.py

```
from flask import Flask, render_template, request, redirect, url_for, session,
flash
from flask_sqlalchemy import SQLAlchemy
from werkzeug.security import generate_password_hash, check_password_hash
import secrets

# print(secrets.token_hex(16))

app = Flask(__name__)
app.secret_key = secrets.token_hex(16)
app.config['SQLALCHEMY_DATABASE_URI'] = 'sqlite:///users.db' # SQLite
database, change for other databases
db = SQLAlchemy(app)

# Define the User model
class User(db.Model):
    id = db.Column(db.Integer, primary_key=True)
    username = db.Column(db.String(50), unique=True, nullable=False)
    password = db.Column(db.String(256), nullable=False)

# Ensure the creation of all tables inside the application context
with app.app_context():
    db.create_all()

@app.route("/")
def home():
    # Render the static HTML page located in the "templates" folder
    return render_template("index.html")

# Define a route for the registration page
@app.route('/register', methods=['GET', 'POST'])
def register():
    if request.method ==  'POST':
        username =
        request.form['username']
```

```
        password = request.form['password']

        # Check if the username is already taken
        if User.query.filter_by(username=username).first():
            flash('Username already taken. Please choose another.', 'error')
        else:
            # Hash the password before storing it
            hashed_password = generate_password_hash(password,
method='pbkdf2:sha256')

            # Create a new user instance
            new_user = User(username=username, password=hashed_password)

            # Add the user to the database
            db.session.add(new_user)
            db.session.commit()

            flash('Registration successful. You can now log in.', 'success')
            return redirect(url_for('login'))

    return render_template('register.html')

# Define a route for the login page
@app.route('/login', methods=['GET', 'POST'])
def login():
    if request.method  ==  'POST':
        username = request.form['username']
        password = request.form['password']

        # Query the user from the database
        user = User.query.filter_by(username=username).first()

        # Check if the username exists and the password is correct
        if user and check_password_hash(user.password, password):
            session['username'] = username
            flash('Login successful!', 'success')
            return redirect(url_for('dashboard'))
        else:
            flash('Invalid username or password. Please try again.', 'error')
    return render_template('login.html')

# Define a route for the dashboard (a protected route accessible only after login)
@app.route('/dashboard')
def dashboard():
    if 'username' in session:
        return f'Welcome to the dashboard, {session["username"]}!'
    else:
        flash('Please log in to access the dashboard.', 'info')
        return redirect(url_for('login'))

# Logout route
@app.route('/logout')
def logout():
    session.pop('username', None)
    flash('You have been logged out.', 'info')
    return redirect(url_for('login'))

if__name__== '__main
    __': app.run(debug=True)
```

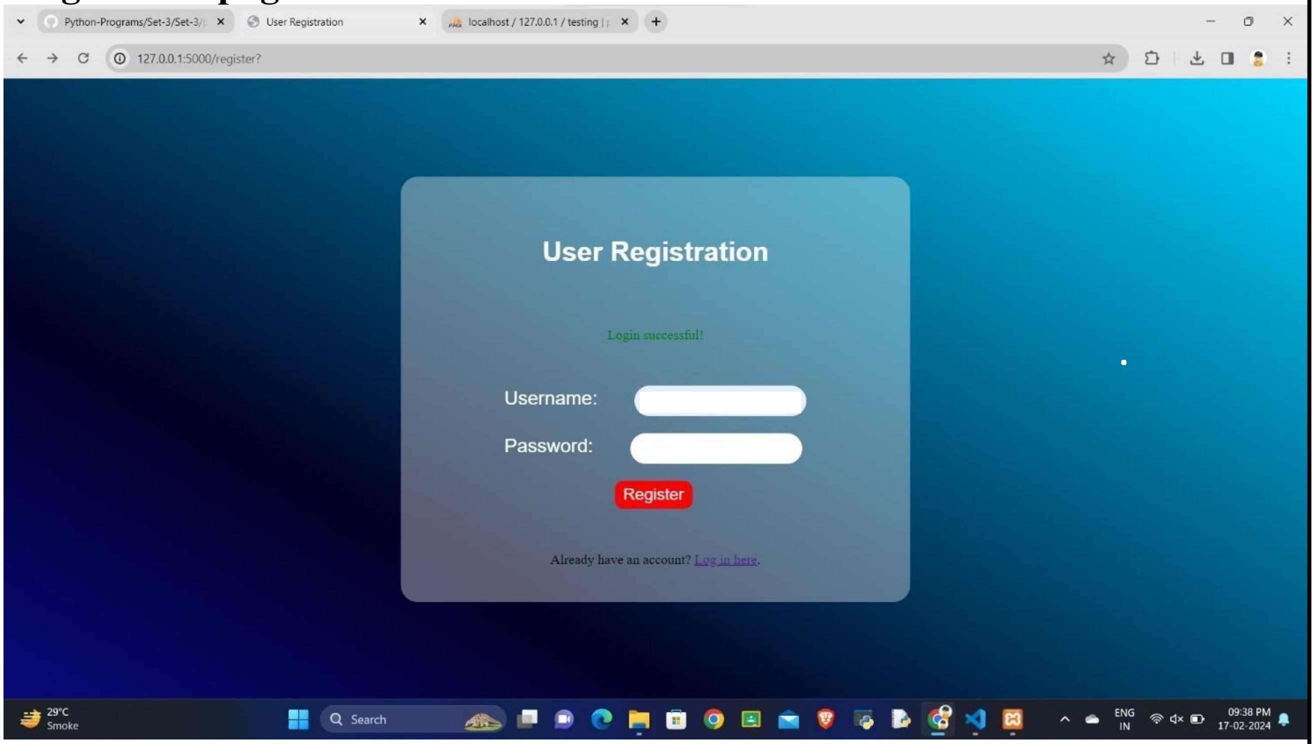
Output:

#static html page:



Hello, this is a static HTML page served by Flask!

#Registation page


User Registration

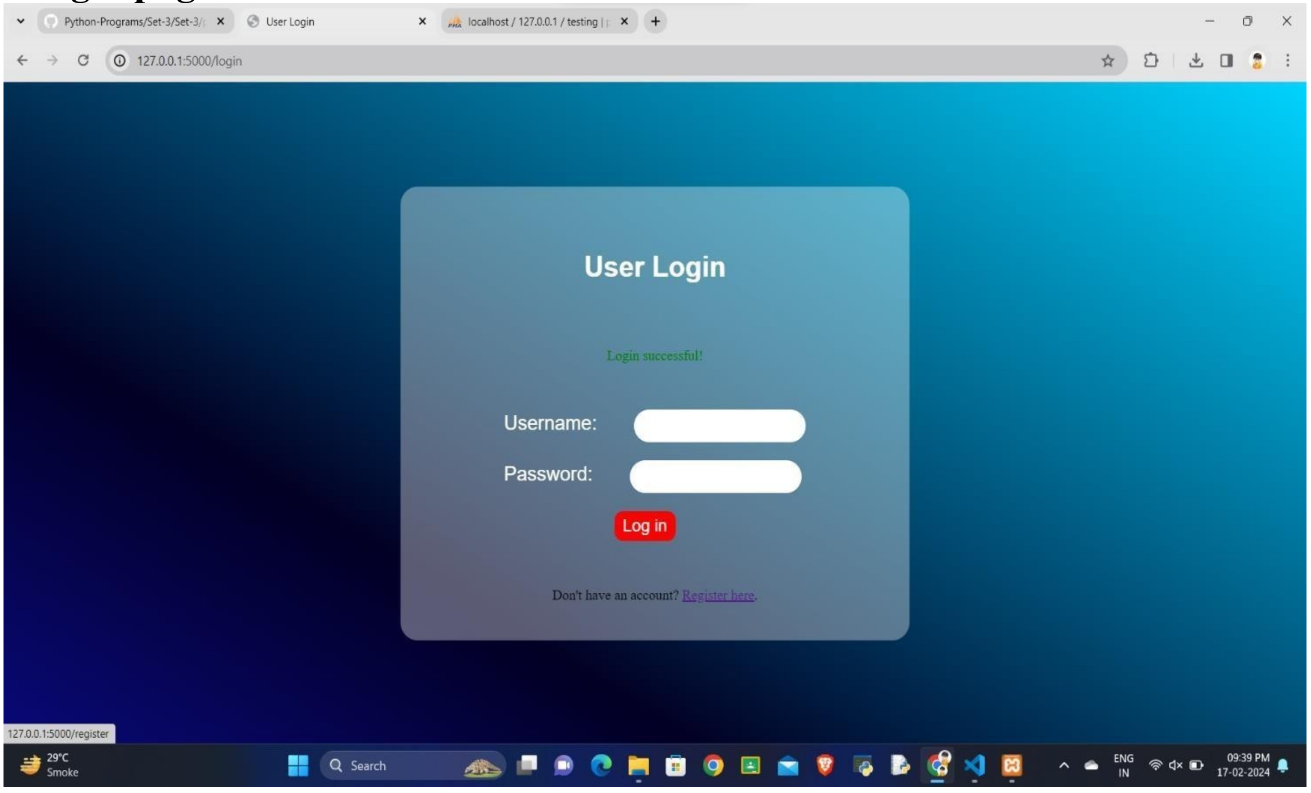
Login successful!

Username:

Password:

Already have an account? Log in here.

#Login page


User Login

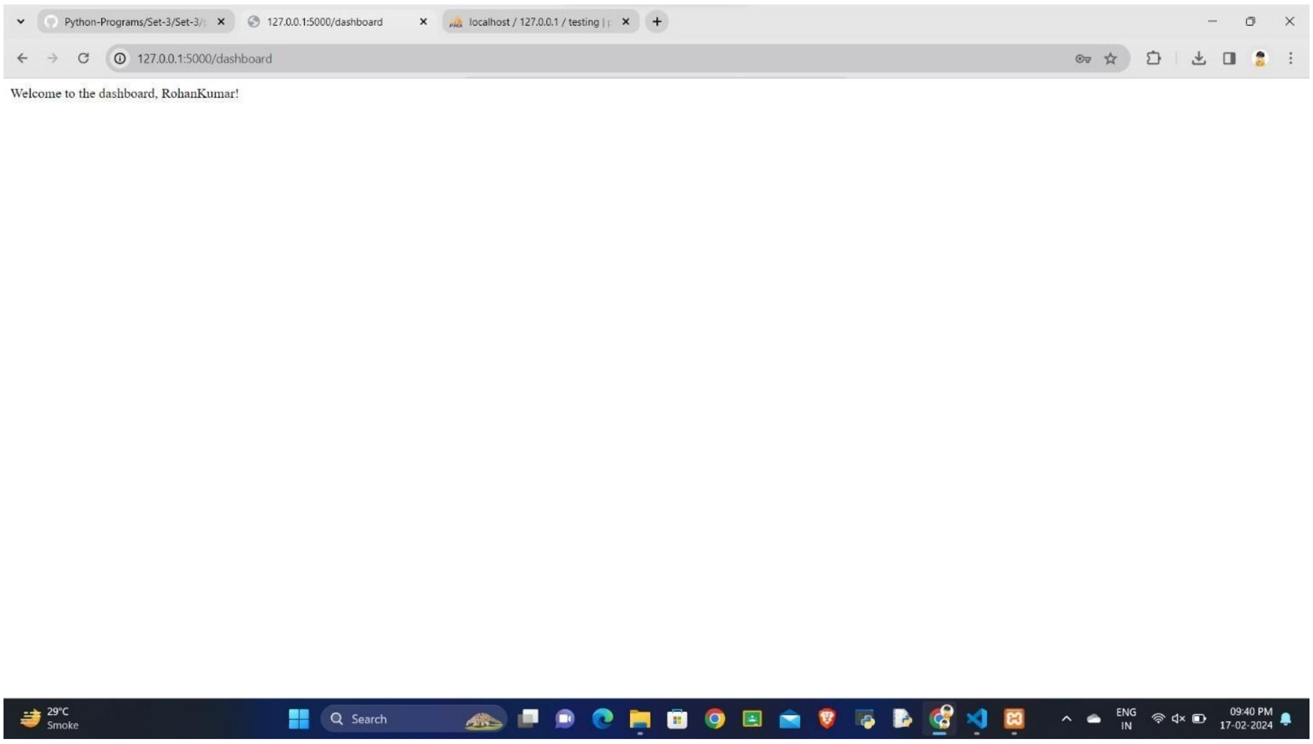
Login successful!

Username:

Password:

Don't have an account? Register here.

#Dashboard



Welcome to the dashboard, RohanKumar!

Conclusion:

Here We have successfully creates a web application that allows users to register and login.

Program No:3

Problem statement:

A program that creates a web application that allows users to upload and download files.

Aim:

To solve this problem statement.

Problem Description:

Develop a Flask-based web application featuring:

1. File Upload:

• Users can upload files through a web form.

• Prevent form submission without selecting a file.

• Save uploaded files to a server directory (e.g., uploads).

2. File Display:

• Display a dynamic list of uploaded files on the main page.

• Each file entry includes a "Download" button.

3. File Download:

• Enable users to download files by clicking the corresponding "Download" button.

4. User Interface:

• Design a clean and user-friendly interface using HTML templates.

• Separate application code (app.py) and HTML templates.

Algorithm:

Step 1: start
Step 2: create a Project Structure
Step 3: Write a HTML file and save as a
index.htmlfile **Step 4:** Write a Flask file and save as a
app.py file **Step 5:** Run that Flask file.
Step 6: Stop

HTML FILE

index.html

```
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="UTF-8">
   <meta name="viewport" content="width=device-width, initial-scale=1.0">
   <title>File Upload and Download</title>
</head>
<body>
   <h1>File Upload and Download</h1>
   <form action="/upload" method="post" enctype="multipart/form-data">
      <label for="file">Choose a file:</label>
      <input type="file" name="file" id="file" required>
      <br>
      <input type="submit" value="Upload">
   </form>

   <h2>Uploaded Files</h2>
   {% for filename in filenames %}
      <div>
         <span>{{ filename }}</span>
         <a href="{{ url_for('download_file', filename=filename) }}" download>
            <button>Download</button>
         </a>
      </div>
   {% endfor %}
</body>
</html>
```

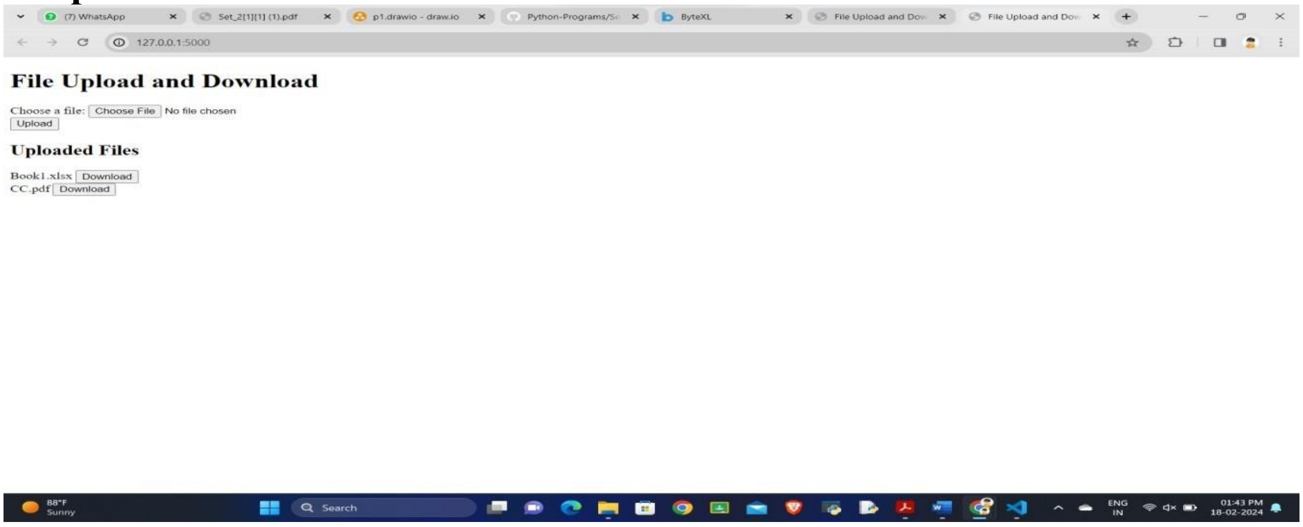
FLSK FILE

app.py

```
from flask import Flask, render_template, request, send_from_directory,
redirect, url_for
import os
app = Flask(__name__)
```

```
UPLOAD_FOLDER = 'uploads'
app.config['UPLOAD_FOLDER'] = UPLOAD_FOLDER
os.makedirs(UPLOAD_FOLDER, exist_ok=True)
@app.route('/')
def index():
   filenames = os.listdir(app.config['UPLOAD_FOLDER'])
   return render_template('index.html', filenames=filenames)
@app.route('/upload', methods=['POST'])
def upload_file():
   if 'file' not in request.files:
      return "No file part"
file = request.files['file']
   if file.filename == '':
      return "No selected file"
   file.save(os.path.join(app.config['UPLOAD_FOLDER'], file.filename))
   return redirect(url_for('index'))
@app.route('/download/<filename>')
def download_file(filename):
   return send_from_directory(app.config['UPLOAD_FOLDER'], filename)

if__name__== '__main
   __': app.run(debug=True)
```

Output:



File Upload and Download

Choose a file: Choose File No file chosen
Upload

Uploaded Files

Book1.xlsx Download
CC.pdf Download

Conclusion:

Here We have successfully creates a web application that allows users to upload and download files.

Program No:4

Problem statement:

A program that creates a web application that displays data from a database in a tabular format.

Aim:

To solve this problem statement.

Problem Description:

The program utilizes Flask, SQLAlchemy, and Pandas to create a web application. It defines a simple SQLAlchemy model (Person) to represent data with attributes like name and age. Sample data is inserted into an SQLite database. The main route (/) queries the database, converts the data to a Pandas DataFrame, and renders it as an HTML table using a Flask template (index.html).

Algorithm:

Step 1: start

Step 2: create a Project Structure

Step 3: Write a HTML file and save as a
index.htmlfile **Step 4:** Write a Flask file and save as a
app.py file **Step 5:** Run that Flask file.

Step 6: Stop

HTML FILE

index.html

```
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="UTF-8">
   <meta name="viewport" content="width=device-width, initial-scale=1.0">
   <title>Data Display</title>
   <link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/4.0.0/css/bootstrap.min.css">
</head>
<body>
   <div class="container mt-5">
```

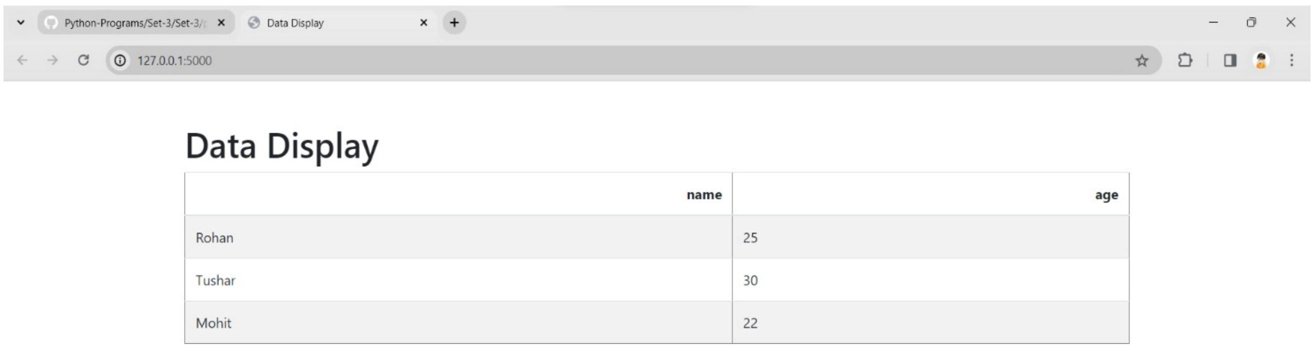
```
        <h1>Data Display</h1>
        <!-- Render the HTML table -->
        {{ table_html | safe }}
    </div>
</body>
</html>
```

FLSK FILE

app.py

```
from flask import Flask,
render_template import pandas as pd

app = Flask(__name__)
sample_data = {'name': ['John', 'Alice', 'Bob'],
               'age': [25, 30, 22]}
df = pd.DataFrame(sample_data)
@app.route('/')
def display_data():
    table_html = df.to_html(classes='table table-striped', index=False)
    return render_template('index.html', table_html=table_html)

if__name__== '__main
    __': app.run(debug=True)
```

Output:



Data Display

name	age
Rohan	25
Tushar	30
Mohit	22

Conclusion:

Here We have successfully creates a web application that displays data from a database in a tabular format.

Program No:5

Problem statement:

A program that creates a web application that accepts user input and sends it to a server-side script for processing.

Aim:

To solve this problem statement.

Problem Description:

You are tasked with creating a web application using Flask that enables users to input data on the main page through a form. The entered data should be sent to the server, processed by a server-side script, and the result displayed on the same page. The provided code includes a basic structure for achieving this, where user input is obtained from a form, and a simple processing logic is applied.

Algorithm:

Step 1: start
Step 2: create a Project Structure
Step 3: Write a HTML file and save as a
index.htmlfile **Step 4:** Write a Flask file and save as a
app.py file **Step 5:** Run that Flask file.
Step 6: Stop

HTML FILE
index.html

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>User Input</title>
  </head>
  <style>
    * {
      margin: 0;
      padding: 0;
      box-sizing: border-box;
    }
    body {
      height: 100vh;
      width: 100%;
      background: #a2d2ff;
      display: flex;
      align-items: center;
      justify-content: center;
      flex-direction:
      column;
    }
    .container {
      display: flex;
      align-items: center;
      justify-content: space-
      evenly; flex-direction:
      column; width: 500px;
      height: 600px;
      border-radius:
      20px;
      background: #ffffff5a;
      backdrop-filter:
      blur(20px); & h1{
        font-family: Arial, Helvetica, sans-serif;
        color: #3a86ff;
        font-size: 2rem;
      }
      & label{
        color: #3a86ff;
        font-family: Arial, Helvetica, sans-
        serif; font-size: 1.2rem;
        padding: 10px;
        margin: 10px 20px;
      }
      & .enter{
        padding: 10px
        20px; border: none;
        outline: none;
```

```
border-radius:
20px;
```

```
      }
      & .submit{
        padding: 10px 20px;
        color: #fff;
        background: #2a9d8f;
        outline: none;
        border: none;
        border-radius:
        10px; transition:
        .3s;
        transform: translateX(150px);
        margin: 30px;
        &:hover{ colo
          r: #000;
          cursor: pointer;
          background: #fff;
        }
      }
      & h2{
        font-family: Arial, Helvetica, sans-serif;
        color: #3a86ff;
        font-size: 2rem;
      }
    }
  </style>
  <body>
    <div class="container">
      <h1>User Input Form</h1>
      <form method="post" action="/">
        <label for="user_input">Enter something:</label>
        <input type="text" class="enter" name="user_input" id="user_input"
required />
        <br />
        <input class="submit" type="submit" value="Submit" />
      </form>

      {% if result %}
      <div>
        <h2>Result:</h2>
        <p>{{ result }}</p>
```

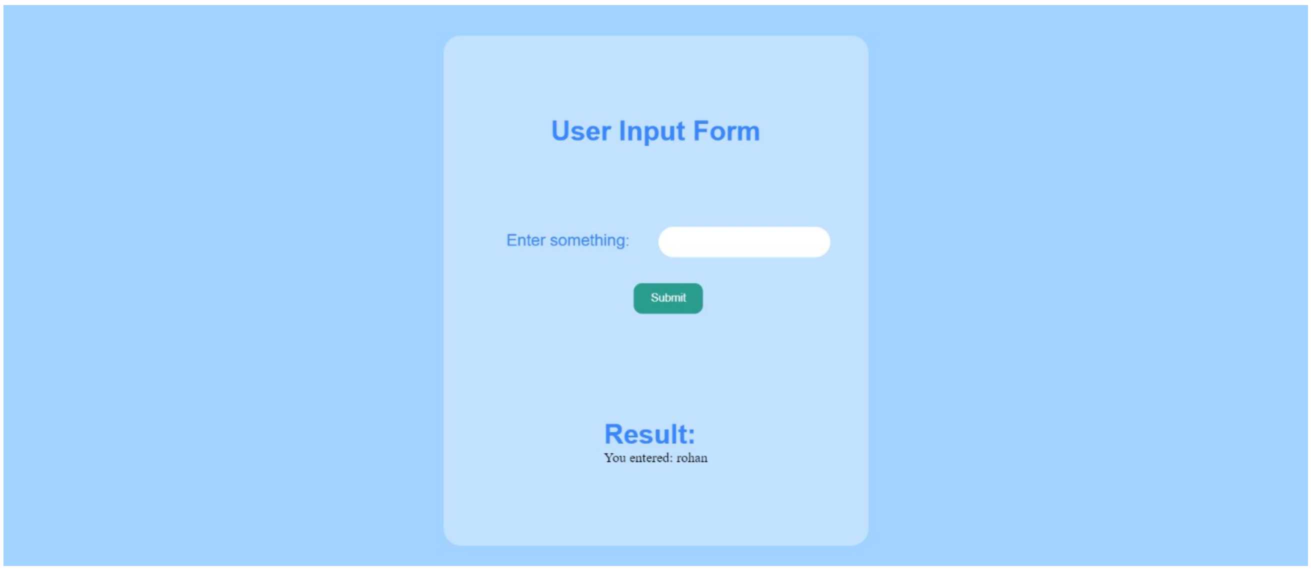
```
      </div>
      {% endif %}
    </div>
  </body>
</html>
```

FLSK FILE

app.py

```
from flask import Flask, render_template, request

app = Flask(__name__)
@app.route('/', methods=['GET', 'POST'])
def index():
    result = None
    if request.method == 'POST':
        # Get user input from the form
        user_input = request.form.get('user_input')
        result = f"You entered: {user_input}"
    return render_template('index.html', result=result)

if__name__== '__main
    __': app.run(debug=True)
```

Output:



You entered: rohan

Conclusion:

Here We have successfully creates a web application that accepts user input and sends it to a server-side script for processing.