COMPUTER SCIENCE PROJECT

By:

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Grade : 12
Class: Wisdom
School: Samsidh Mount Litera Zee School, Vidyaranyapura

TOPIC:
Python Supply Chain Authentication & Management

INDEX

CERTIFICATE

This is to certify that **Aryan Kiran C** , student of grade XII Wisdom class has successfully prepared the report on the project " Supply Chain Authentication & Management " under the able guidance of **Mrs. Sri Gauri Ma'am** (Computer Science Teacher). The report is the result of her efforts and endeavors. The report is found worthy of acceptance as final project report for the respective topic for the academic year 2023-24 in the subject of **Computer Science.**

ACKNOWLEDGEMENT

Throughout the process, we tackled complex algorithms, and ultimately learned valuable skills and knowledge. It would be remiss of us not to express our sincere gratitude to the individuals and resources that supported us on this path. At the heart of this project stands the incredible team that brought it to life. Each member contributed their unique strengths and talents, forming a synergistic force that propelled us forward.

We are fortunate to have received the guidance and support of dedicated mentors and instructors. Their expertise in the field of computer science proved invaluable at every stage of the project. We would like to express our sincere gratitude to our computer science teacher **Mrs. Sri Gauri Ma'am** for giving us this opportunity to present our views on the topic and also to give us a chance to build on it.

We embarked on this project with a vision and a desire to learn. Through collaboration, perseverance, and the support of remarkable individuals and resources, we are proud to present the culmination of our efforts. We extend our sincerest thanks to everyone who contributed to this journey, making it an enriching and unforgettable experience.

Signature of Teacher in charge

Signature of Principal

SYSTEM REQUIREMENTS

- Operating System: Windows/Linux/Mac
- Python Version: 3.7 or later
- Libraries: Flask, os, hashlib, base64, uuid, mysql.connector, qrcode, datetime, csv
- Database: MYSQL
- RAM: 4GB and above

IMPORTANT NOTE:

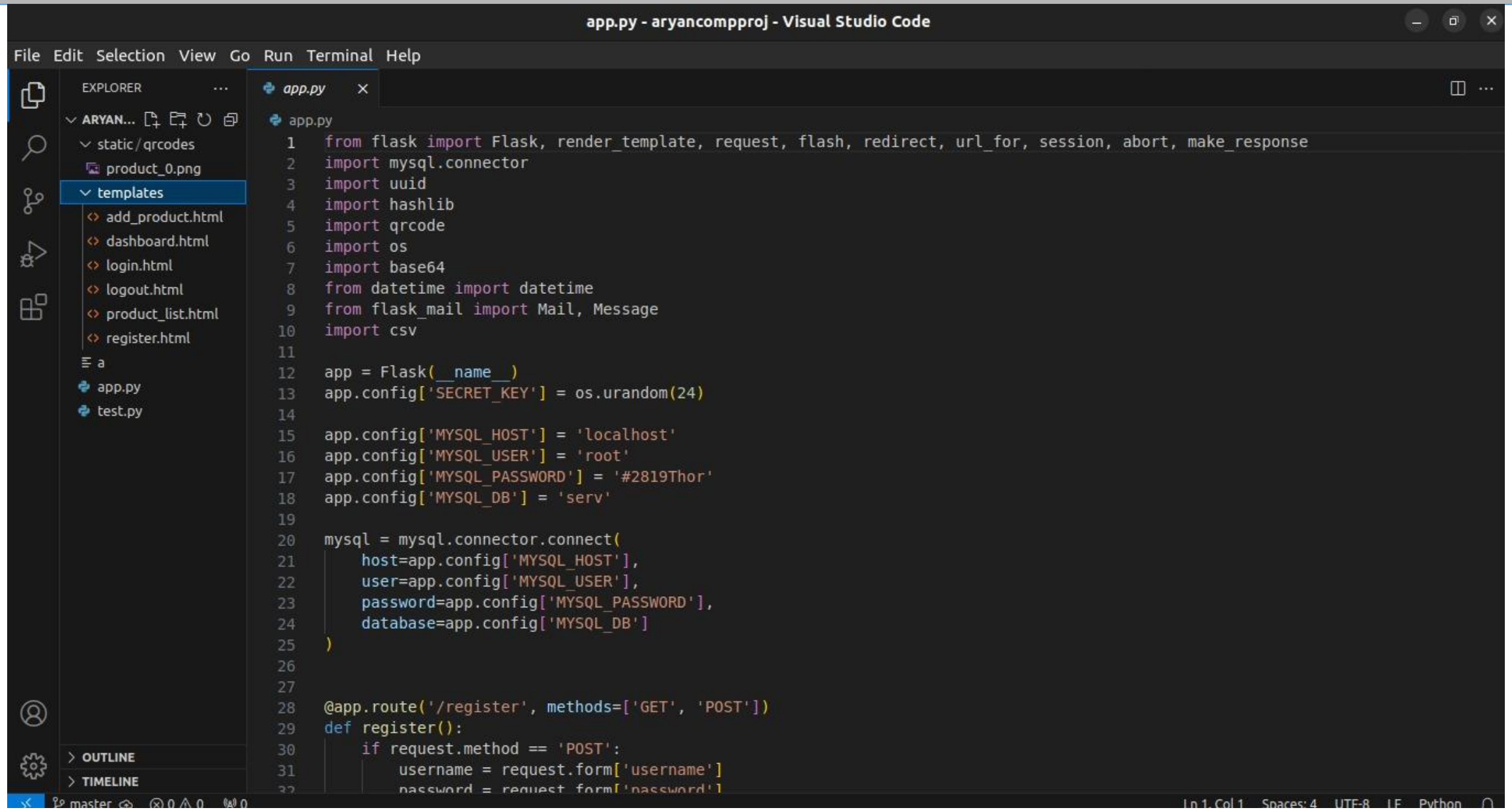
- Before working on this project please ensure that the latest version of python(3.12) is installed along with the appropriate Python language interpreter as well.

- For making this project, VS Code application was used instead of python IDLE.

ABOUT THE PROJECT

- Trust becomes crucial in business during this digital age. To empower consumers and ensure transparency from food supply to machinery, we use QR codes to track the origins of the product in supply chains
- Suppliers are equally benefited by streamlining their processes in a one-stop solution where they can track their shipments, with our mechanisms like exporting combined CSV files of products and referring time stamps.
- Such a microservice has scope for scaling as it requires no large commitments and costs, and can benefit a number of businesses through one platform only.
- Built with Python and Flask architecture, and a MYSQL database, this service integrates password hashing, QR code info encoding, and easy data access.
- We must understand the significance of products' journeys as business consumer interaction is revolutionized in this digital era.
- In the future this idea could not only expand to email and sms verification, but blockchains and decentralised mechanisms to track at every stage.

SOURCE CODE


app.py - aryancompproj - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
ARYAN...
static / qrcodes
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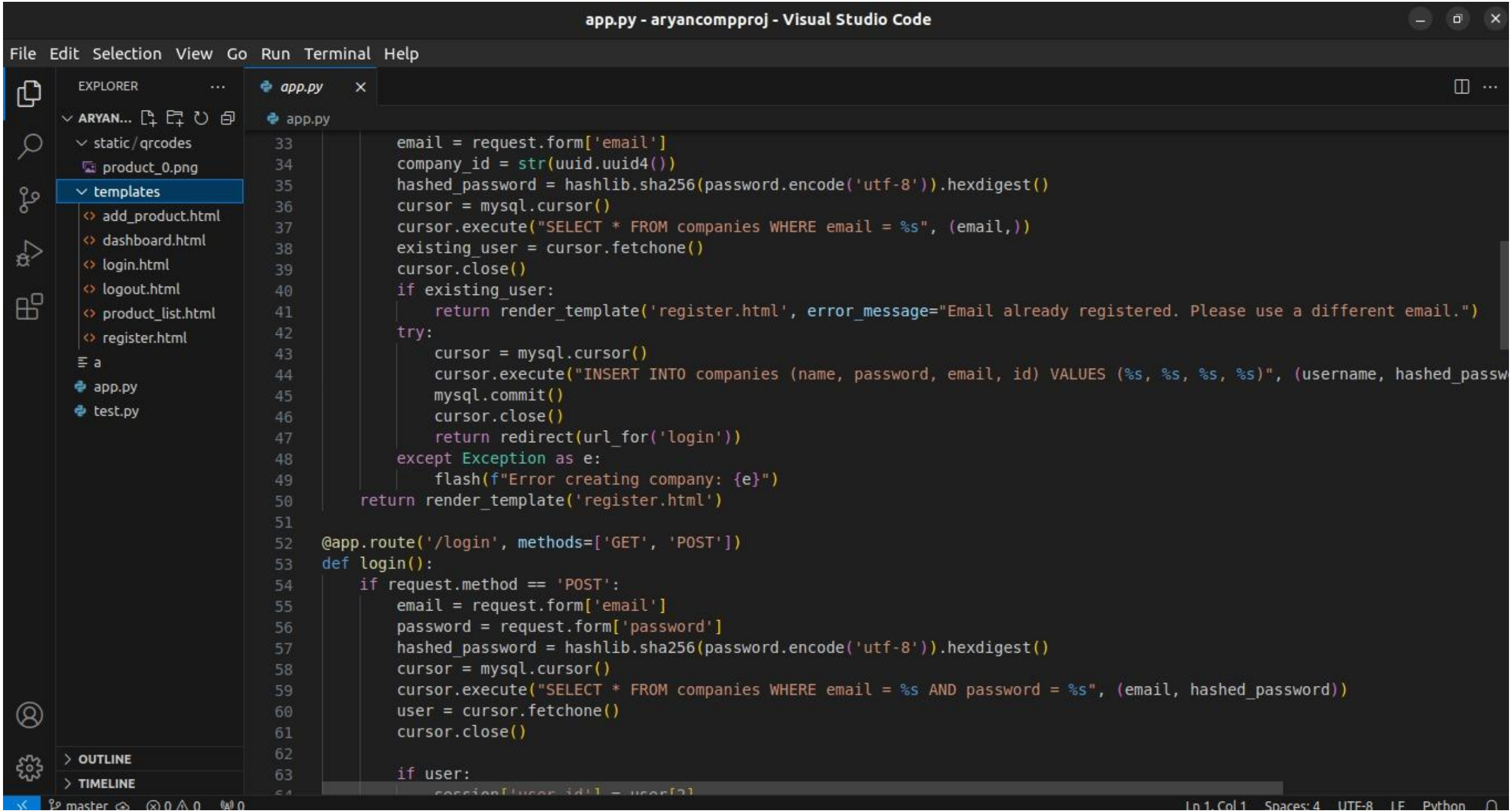
OUTLINE
TIMELINE
app.py
1 from flask import Flask, render_template, request, flash, redirect, url_for, session, abort, make_response
2 import mysql.connector
3 import uuid
4 import hashlib
5 import qrcode
6 import os
7 import base64
8 from datetime import datetime
9 from flask_mail import Mail, Message
10 import csv
11
12 app = Flask(__name__)
13 app.config['SECRET_KEY'] = os.urandom(24)
14
15 app.config['MYSQL_HOST'] = 'localhost'
16 app.config['MYSQL_USER'] = 'root'
17 app.config['MYSQL_PASSWORD'] = '#2819Thor'
18 app.config['MYSQL_DB'] = 'serv'
19
20 mysql = mysql.connector.connect(
21 host=app.config['MYSQL_HOST'],
22 user=app.config['MYSQL_USER'],
23 password=app.config['MYSQL_PASSWORD'],
24 database=app.config['MYSQL_DB']
25)
26
27
28 @app.route('/register', methods=['GET', 'POST'])
29 def register():
30 if request.method == 'POST':
31 username = request.form['username']
Ln 1, Col 1 Spaces: 4 UTF-8 LF Python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app.py
email = request.form['email']
company_id = str(uuid.uuid4())
hashed_password = hashlib.sha256(password.encode('utf-8')).hexdigest()
cursor = mysql.cursor()
cursor.execute("SELECT * FROM companies WHERE email = %s", (email,))
existing_user = cursor.fetchone()
cursor.close()
if existing_user:
return render_template('register.html', error_message="Email already registered. Please use a different email.")
try:
cursor = mysql.cursor()
cursor.execute("INSERT INTO companies (name, password, email, id) VALUES (%s, %s, %s, %s)", (username, hashed_passw
mysql.commit()
cursor.close()
return redirect(url_for('login'))
except Exception as e:
flash(f"Error creating company: {e}")
return render_template('register.html')
@app.route('/login', methods=['GET', 'POST'])
def login():
if request.method == 'POST':
email = request.form['email']
password = request.form['password']
hashed_password = hashlib.sha256(password.encode('utf-8')).hexdigest()
cursor = mysql.cursor()
cursor.execute("SELECT * FROM companies WHERE email = %s AND password = %s", (email, hashed_password))
user = cursor.fetchone()
cursor.close()
if user:
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UTF-8
LF
Python

app.py - aryancompproj - Visual Studio Code

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EXPLORER

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app.py

app.py

```
64                  session['user_id'] = user[2]
65                  return redirect(url_for('dashboard'))
66          return render_template('login.html')
67
68  @app.route('/dashboard')
69  def dashboard():
70      if 'user_id' not in session:
71          abort(403)  # Forbidden
72
73      return render_template('dashboard.html')
74
75  @app.route('/logout')
76  def logout():
77      session.pop('user_id', None)
78      flash('Logout successful!')
79      return redirect(url_for('login'))
80
81  @app.route('/add_product', methods=['GET', 'POST'])
82  def add_product():
83      if 'user_id' not in session:
84          abort(403)
85
86      if request.method == 'POST':
87          product_name = request.form['product_name']
88          description = request.form['description']
89          user_id = session['user_id']
90          id = str(uuid.uuid4())
91          cursor = mysql.cursor()
92          cursor.execute("INSERT INTO products (name, description, id, user_id, time) VALUES (%s, %s, %s, %s, %s)", (product_name
93          product_id = cursor.lastrowid
94          mysql.commit()
95          cursor.close()
```

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OUTLINE

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app.py

```
94            mysql.commit()
95            cursor.close()
96            return redirect(url_for('product_list'))
97
98        return render_template('add_product.html')
99
100   @app.route('/product_list')
101   def product_list():
102       if 'user_id' not in session:
103           abort(403)
104
105       user_id = session['user_id']
106       cursor = mysql.cursor(dictionary=True)
107       cursor.execute("SELECT * FROM products WHERE user_id = %s", (user_id,))
108       products = cursor.fetchall()
109       cursor.close()
110
111       for product in products:
112           qr = qrcode.QRCode(version=1, box_size=10, border=5)
113           qr.add_data(f"{product['name']} - {product['description']} - {product['time']} - {product['user_id']}")
114           qr.make(fit=True)
115
116           img = qr.make_image(fill_color="black", back_color="white")
117
118           img_path = f"qrcode_{product['id']}.png"
119           img.save(img_path)
120
121           with open(img_path, "rb") as img_file:
122               img_binary = img_file.read()
123               product['qrcode'] = base64.b64encode(img_binary).decode('utf-8')
124
125           os.remove(img_path)
```

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app.py

```python
@app.route('/download_csv')
def download_csv():
    if 'user_id' not in session:
        abort(403)  # Forbidden

    user_id = session['user_id']

    # Retrieve all products for the user from the database
    cursor = mysql.cursor(dictionary=True)
    cursor.execute("SELECT name, description, time FROM products WHERE user_id = %s", (user_id,))
    products = cursor.fetchall()
    cursor.close()

    # Create a CSV file in memory
    csv_data = []
    csv_data.append(','.join(['Product Name', 'Description', 'Time']))

    # Write product data
    for product in products:
        csv_data.append(','.join([product['name'], product['description'], str(product['time'])]))

    # Create a response with the CSV data
    response = make_response('\n'.join(csv_data))
    response.headers["Content-Disposition"] = "attachment; filename=products.csv"
    response.headers["Content-type"] = "text/csv"

    return response

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

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add_product.html

templates > add_product.html > ...

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Add Product</title>
</head>
<body>
    <h2>Add Product</h2>
    <form method="POST" action="{{ url_for('add_product') }}">
        <label for="product_name">Product Name:</label>
        <input type="text" name="product_name" required><br><br>
        <label for="description">Description:</label>
        <textarea name="description" required></textarea><br><br>
        <button type="submit">Add Product</button>
    </form>
    <p><a href="{{ url_for('dashboard') }}">Back to Dashboard</a></p>
</body>
</html>
```

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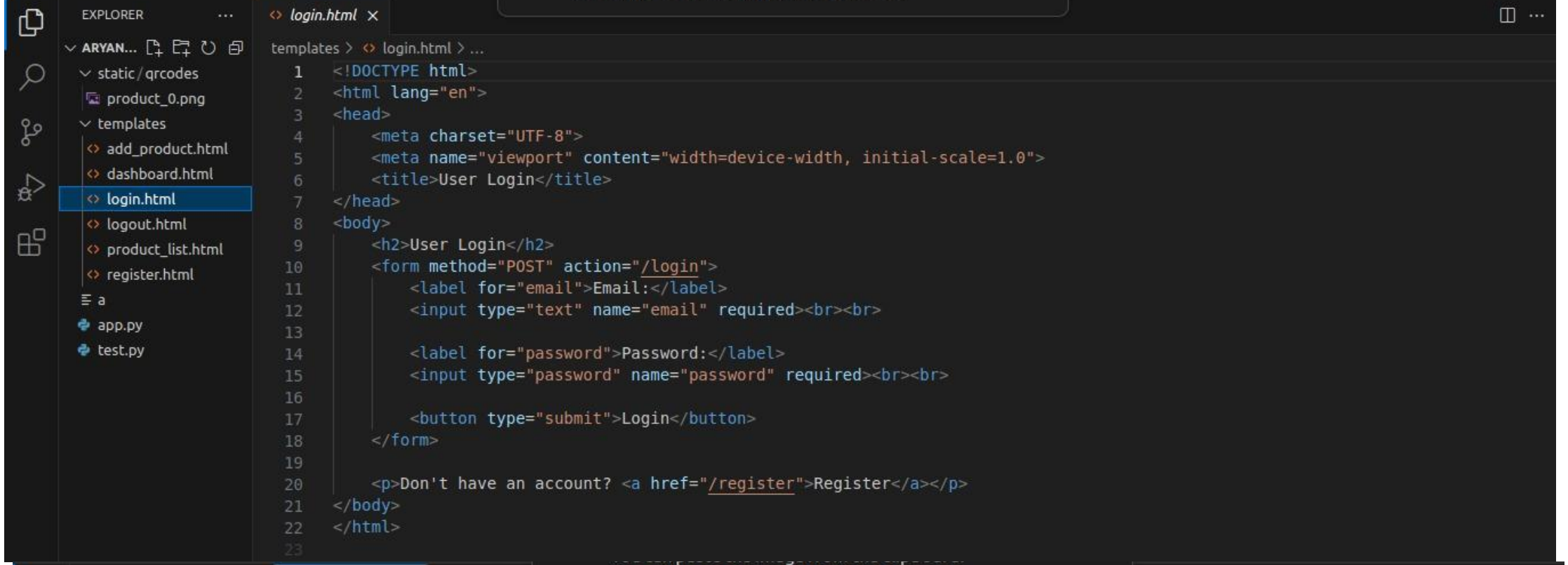
dashboard.html

templates > dashboard.html > ...

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>User Dashboard</title>
</head>
<body>
    <h2>Welcome to Your Dashboard</h2>

    <a href="{{ url_for('add_product') }}"><button>Add Product</button></a>
    <a href="{{ url_for('product_list') }}"><button>Product List</button></a>
    <a href="{{ url_for('logout') }}"><button>Logout</button></a>
</body>
</html>
```

Follow link (ctrl + click)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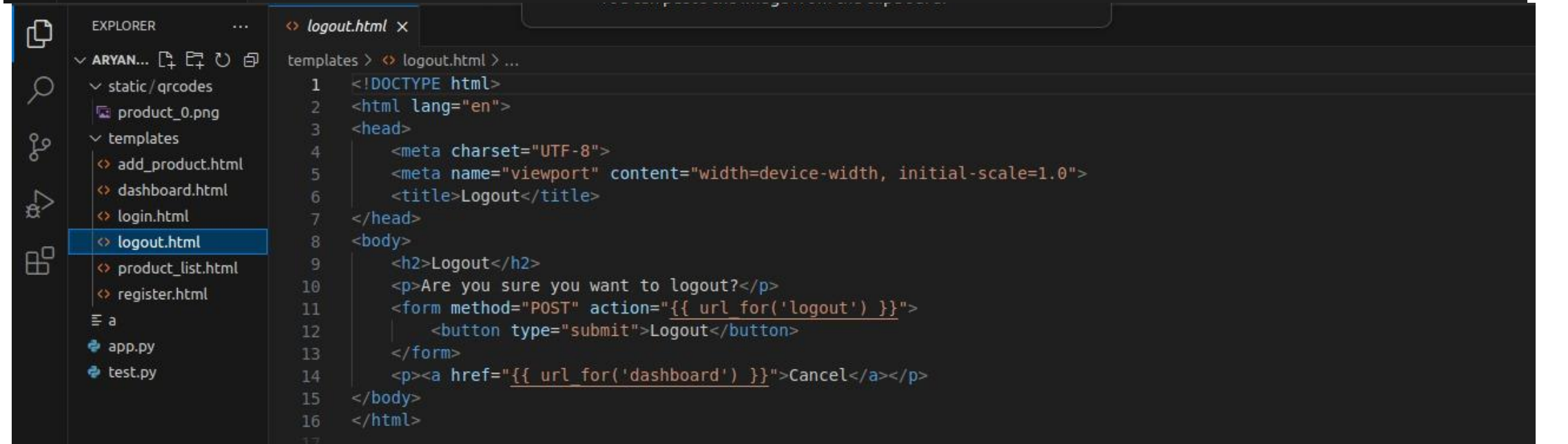
templates > login.html > ...
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4 <meta charset="UTF-8">
5 <meta name="viewport" content="width=device-width, initial-scale=1.0">
6 <title>User Login</title>
7 </head>
8 <body>
9 <h2>User Login</h2>
10 <form method="POST" action="/login">
11 <label for="email">Email:</label>
12 <input type="text" name="email" required>

13
14 <label for="password">Password:</label>
15 <input type="password" name="password" required>

16
17 <button type="submit">Login</button>
18 </form>
19
20 Don't have an account? Register
21 </body>
22 </html>
23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logout.html
product_list.html
register.html
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app.py
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logout.html
templates > logout.html > ...
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4 <meta charset="UTF-8">
5 <meta name="viewport" content="width=device-width, initial-scale=1.0">
6 <title>Logout</title>
7 </head>
8 <body>
9 <h2>Logout</h2>
10 Are you sure you want to logout?
11 <form method="POST" action="{{ url_for('logout') }}">
12 <button type="submit">Logout</button>
13 </form>
14 Cancel
15 </body>
16 </html>

product_list.html

templates > product_list.html > ...

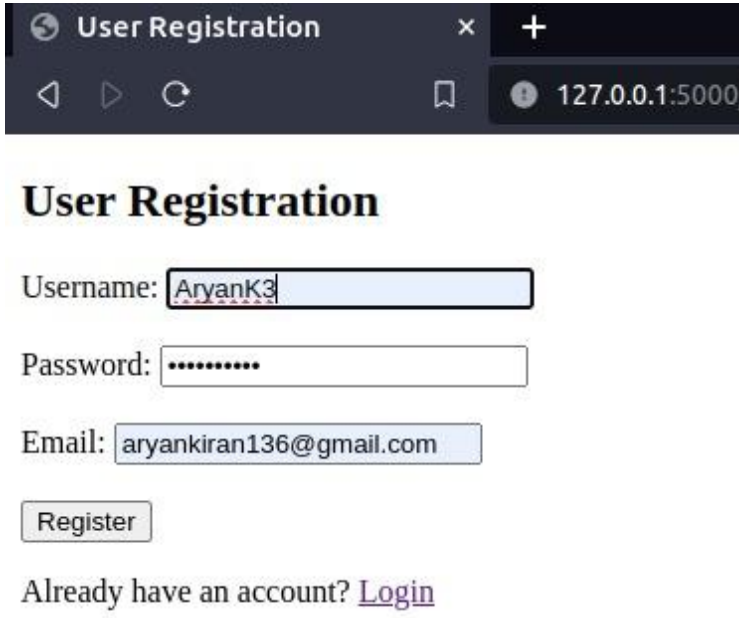
```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Product List</title>
</head>
<body>
    <h2>Product List</h2>
    {% if products %}
        <ul>
            {% for product in products %}
                <li>
                    {{ product.name }} - {{ product.description }}
                    <img src="{{ product.qrcode }}" alt="QR Code">
                </li>
            {% endfor %}
        </ul>
    {% else %}
        <p>No products available.</p>
    {% endif %}
    <p><a href="{{ url_for('download_csv') }}" class="btn btn-primary">Download CSV</a></p>
    <p><a href="{{ url_for('dashboard') }}">Back to Dashboard</a></p>
</body>
</html>
```

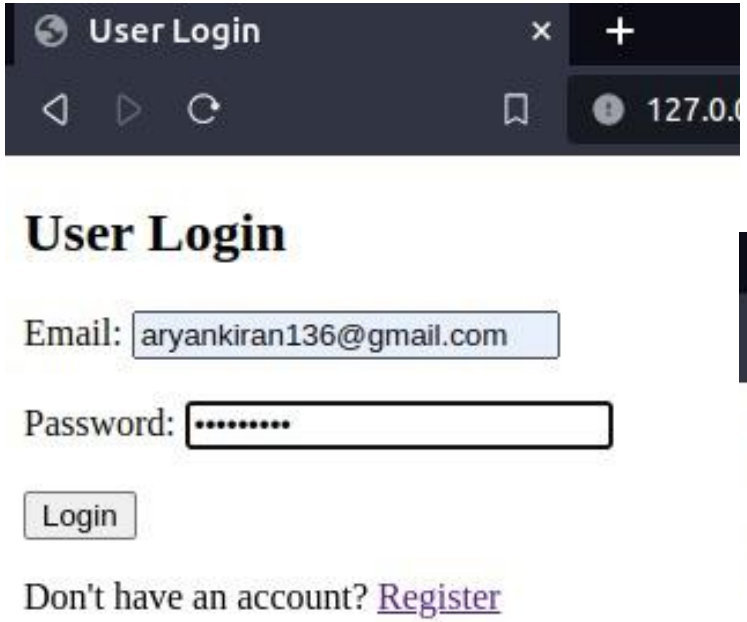
register.html

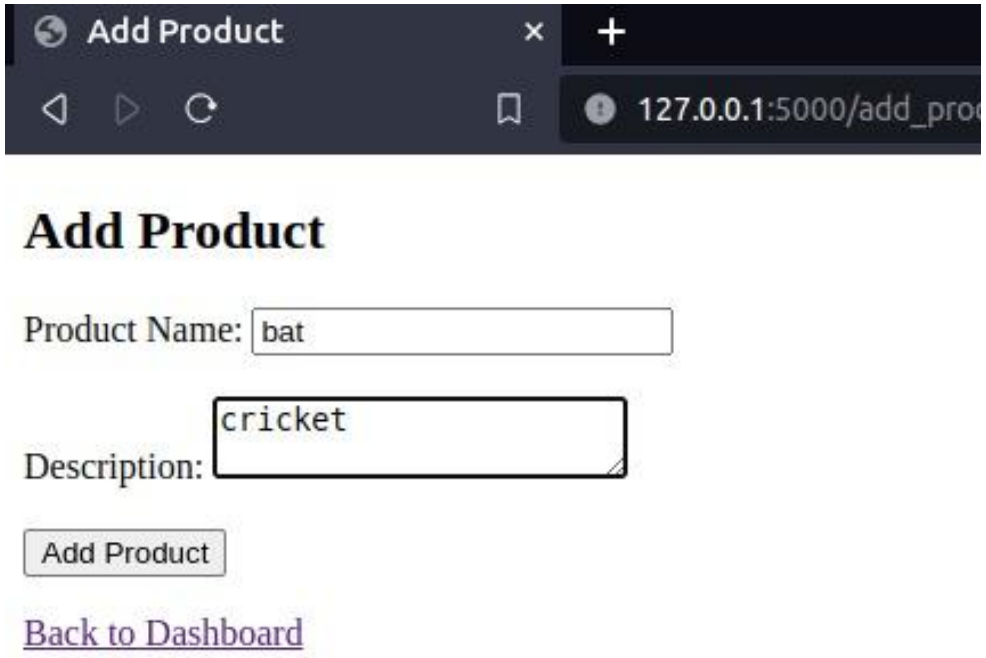
templates > register.html > ...

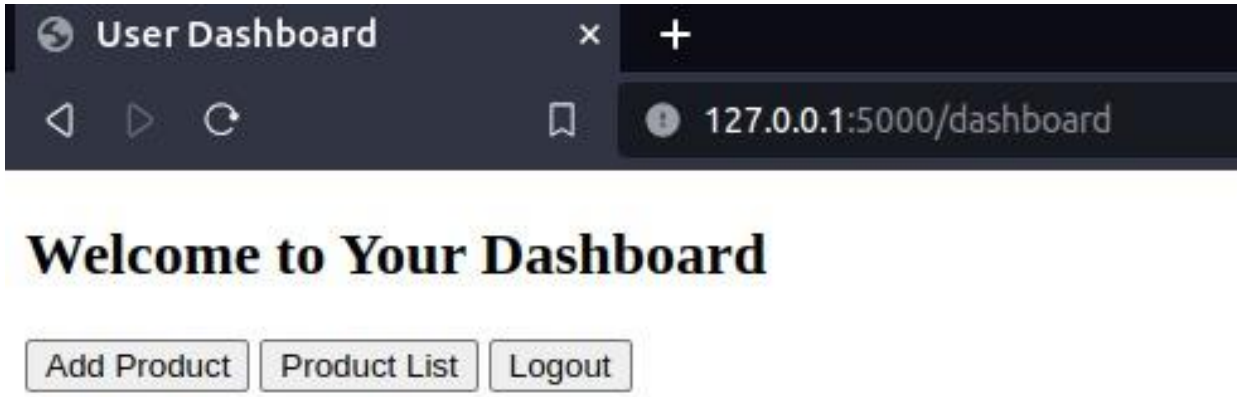
```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>User Registration</title>
</head>
<body>
    <h2>User Registration</h2>
    <form method="POST" action="/register">
        <label for="username">Username:</label>
        <input type="text" name="username" required><br><br>

        <label for="password">Password:</label>
        <input type="password" name="password" required><br><br>

        <label for="email">Email:</label>
        <input type="email" name="email" required><br><br>

        <button type="submit">Register</button>
    </form>

    <p>Already have an account? <a href="/login">Login</a></p>

</body>
</html>
```

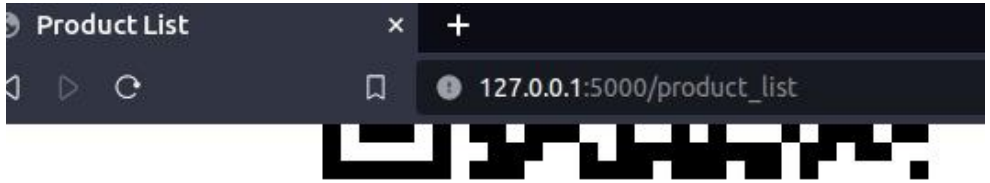
SAMPLE RUN


User Registration
127.0.0.1:5000
User Registration
Username: AryanK3
Password:
Email: aryankiran136@gmail.com
Register
Already have an account? Login


User Login
127.0.0.
User Login
Email: aryankiran136@gmail.com
Password:
Login
Don't have an account? Register

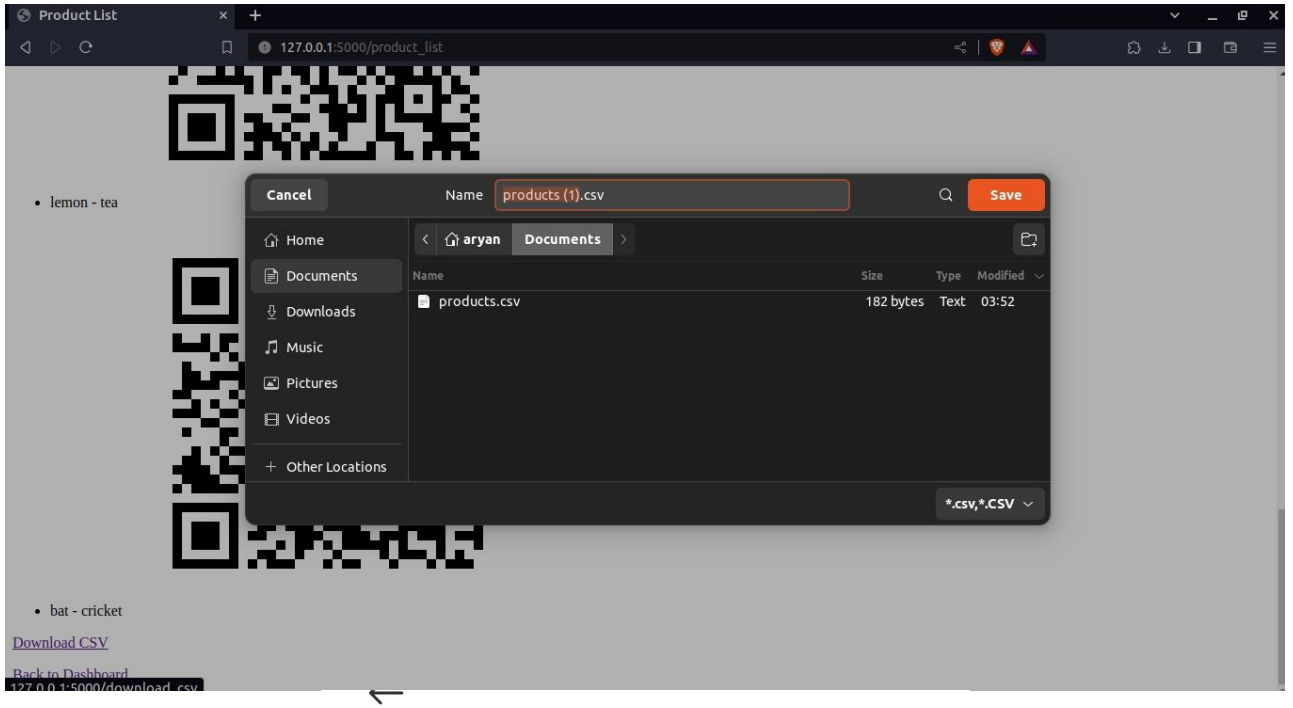

Add Product
127.0.0.1:5000/add_prod
Add Product
Product Name: bat
Description: cricket
Add Product
Back to Dashboard


User Dashboard
127.0.0.1:5000/dashboard
Welcome to Your Dashboard
Add Product
Product List
Logout



- tea - imported

- pea - native



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Result

QR code details:

tea - imported
- 2024-01-17 03:39:01.294537 -
aryankiran316@gmail.com

BIBLIOGRAPHY

- www.realpython.com
- www.freecodecamp.org
- www.cbseacademic.nic.in
- www.stackoverflow.com
- www.github.com