EMPLOYEE MANAGEMENT SYSTEM

by Kumar Kartik

**What is Flask?**

Flask is an API of Python that allows us to build web applications. It was developed by Armin Ronacher. Flask’s framework is more explicit than Django’s framework and is also easier to learn because it has less base code to implement a simple web application. Flask Python is based on the WSGI(Web Server Gateway Interface) toolkit and Jinja2 template engine.

**Advantages of Flask**

1. Flask is a **lightweight** backend framework with minimal dependencies.
2. Flask is **easy to learn** because its simple and intuitive API makes it easy to learn and use for beginners.
3. Flask is a **flexible** **Framework** because it allows you to customize and extend the framework to suit your needs easily.
4. Flask can be used with **any database** like:- SQL and NoSQL and with **any Frontend Technology** such as React or Angular.
5. Flask is **great for small to medium projects** that do not require the complexity of a large framework.

**HTTP method are provided by Flask**

Python Web Framework Flask support various HTTP protocols for data retrieval from the specified URL, these can be defined as:-

| Method | Description |
| --- | --- |
| GET | This is used to send the data in an without encryption of the form to the server. |
| HEAD | provides response body to the form |
| POST | Sends the form data to server. Data received by POST method is not cached by server. |
| PUT | Replaces current representation of target resource with URL. |
| DELETE | Deletes the target resource of a given URL |

Code –

app.py

from flask import Flask, render\_template, request, redirect, url\_for

from flask\_mysqldb import MySQL

import MySQLdb.cursors

import re

from werkzeug.security import generate\_password\_hash

app = Flask(\_\_name\_\_)

app.config['MYSQL\_HOST'] = 'localhost'

app.config['MYSQL\_USER'] = 'root'

app.config['MYSQL\_PASSWORD'] = 'pass@123'

app.config['MYSQL\_DB'] = 'employee\_db'

mysql = MySQL(app)

@app.route('/')

@app.route('/login', methods=['GET', 'POST'])

def login():

    msg = ''

    if request.method == 'POST' and 'username' in request.form and 'password' in request.form and 'role' in request.form:

        username = request.form['username']

        password = request.form['password']

        role = request.form['role']

        cursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)

        cursor.execute('SELECT \* FROM employees WHERE username = %s AND password = %s AND role = %s', (username, password, role))

        account = cursor.fetchone()

        if account:

            if role == 'admin':

                return redirect(url\_for('admin\_dashboard'))

            elif role == 'employee':

                return redirect(url\_for('employee\_dashboard'))

        else:

            msg = 'Incorrect username / password or role!'

    return render\_template('login.html', msg=msg)

@app.route('/logout', methods=['POST'])

def logout():

    return redirect(url\_for('login'))

@app.route('/register', methods=['GET', 'POST'])

def register():

    msg = ''

    if request.method == 'POST':

        username = request.form.get('username')

        password = request.form.get('password')

        role = request.form.get('role')

        email = request.form.get('email')

        mobile\_number = request.form.get('mobile\_number')

        cursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)

        cursor.execute('SELECT \* FROM employees WHERE username = %s', (username,))

        account = cursor.fetchone()

        if account:

            msg = 'Account already exists!'

        elif not re.match(r'[A-Za-z0-9]+', username):

            msg = 'Username must contain only characters and numbers!'

        elif not username or not password:

            msg = 'Please fill out the form!'

        else:

            try:

                cursor.execute('INSERT INTO employees (username, password, role, email, mobile\_number) VALUES (%s, %s, %s, %s, %s)',

                               (username, password, role, email, mobile\_number))

                mysql.connection.commit()

                msg = 'You have successfully registered!'

            except Exception as e:

                mysql.connection.rollback()

                print(f"Error: {e}")

                msg = 'An error occurred. Please try again later.'

    return render\_template('register.html', msg=msg)

@app.route('/delete\_employee/<int:id>', methods=['POST'])

def delete\_employee(id):

    cursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)

    try:

        # Delete the employee record from the database

        cursor.execute('DELETE FROM employees WHERE id = %s', (id,))

        mysql.connection.commit()

        msg = 'Employee has been deleted successfully!'

    except Exception as e:

        mysql.connection.rollback()

        print(f"Error: {e}")

        msg = 'An error occurred while deleting the employee. Please try again later.'

    # Redirect back to the admin dashboard with a success or error message

    return redirect(url\_for('admin\_dashboard'))

@app.route('/admin\_dashboard')

def admin\_dashboard():

    cursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)

    cursor.execute('SELECT id, username, role, email, mobile\_number FROM employees')

    employees = cursor.fetchall()

    return render\_template('admin\_dashboard.html', employees=employees)

@app.route('/employee\_dashboard')

def employee\_dashboard():

    cursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)

    cursor.execute('SELECT id, username, role, email, mobile\_number FROM employees')

    employees = cursor.fetchall()

    return render\_template('employee\_dashboard.html', employees=employees)

@app.route('/edit\_employee/<int:id>', methods=['GET', 'POST'])

def edit\_employee(id):

    cursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)

    if request.method == 'POST':

        username = request.form['username']

        role = request.form['role']

        email = request.form['email']

        mobile\_number = request.form['mobile\_number']

        password = request.form['password']

        # Check if any field has been updated

        cursor.execute('SELECT \* FROM employees WHERE id = %s', (id,))

        employee = cursor.fetchone()

        # Construct the update query

        update\_query = 'UPDATE employees SET username = %s, role = %s, email = %s, mobile\_number = %s'

        params = [username, role, email, mobile\_number]

        if password:

            update\_query += ', password = %s'

            params.append(password)

        update\_query += ' WHERE id = %s'

        params.append(id)

        cursor.execute(update\_query, tuple(params))

        mysql.connection.commit()

        msg = 'Employee updated successfully!' if cursor.rowcount > 0 else 'No changes made.'

        return redirect(url\_for('edit\_employee', id=id, msg=msg))

    else:

        cursor.execute('SELECT \* FROM employees WHERE id = %s', (id,))

        employee = cursor.fetchone()

        return render\_template('edit\_employee.html', employee=employee, msg=request.args.get('msg', ''))

if \_\_name\_\_ == '\_\_main\_\_':

    app.run(debug=True)

Admin\_dashboard.html

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <title>Admin Dashboard</title>

    <link rel="stylesheet" href="{{ url\_for('static', filename='style.css') }}">

    <style>

        /\* Basic Reset \*/

        \* {

            margin: 0;

            padding: 0;

            box-sizing: border-box;

        }

        body {

            font-family: Arial, sans-serif;

            background-color: #f0f2f5;

            color: #333;

        }

        header {

            background-color: #007bff;

            color: white;

            padding: 20px;

            text-align: center;

            box-shadow: 0 4px 8px rgba(0, 0, 0, 0.1);

        }

        .container {

            width: 90%;

            max-width: 1200px;

            margin: 20px auto;

            padding: 20px;

            background-color: white;

            border-radius: 8px;

            box-shadow: 0 4px 8px rgba(0, 0, 0, 0.1);

        }

        h1,

        h2 {

            color: #007bff;

            margin-bottom: 20px;

        }

        p {

            margin-bottom: 20px;

            font-size: 1.1em;

        }

        table {

            width: 100%;

            border-collapse: collapse;

            margin-bottom: 20px;

        }

        table th,

        table td {

            padding: 15px;

            text-align: left;

            border-bottom: 1px solid #ddd;

        }

        table th {

            background-color: #007bff;

            color: white;

        }

        table tr:nth-child(even) {

            background-color: #f9f9f9;

        }

        .actions {

            display: flex;

            gap: 10px;

        }

        .actions a,

        .actions button {

            text-decoration: none;

            padding: 8px 12px;

            border: none;

            border-radius: 4px;

            color: white;

            cursor: pointer;

            font-size: 14px;

        }

        .actions a {

            background-color: #28a745;

        }

        .actions button {

            background-color: #dc3545;

        }

        .actions a:hover {

            background-color: #218838;

        }

        .actions button:hover {

            background-color: #c82333;

        }

        .logout-button {

            background-color: #007bff;

            border: none;

            color: white;

            padding: 10px 20px;

            font-size: 16px;

            cursor: pointer;

            border-radius: 4px;

            margin-top: 20px;

            display: block;

            text-align: center;

        }

        .logout-button:hover {

            background-color: #0056b3;

        }

    </style>

</head>

<body>

    <header>

        <h1>Admin Dashboard</h1>

    </header>

    <div class="container">

        <p>Manage the application effectively from this dashboard.</p>

        <!-- Employee List Section -->

        <h2 style="text-align: center;">All Employees</h2>

        <table>

            <thead>

                <tr>

                    <th>ID</th>

                    <th>Username</th>

                    <th>Role</th>

                    <th>Email</th>

                    <th>Mobile Number</th>

                    <th>Actions</th>

                </tr>

            </thead>

            <tbody>

                {% for employee in employees %}

                <tr>

                    <td>{{ employee['id'] }}</td>

                    <td>{{ employee['username'] }}</td>

                    <td>{{ employee['role'] }}</td>

                    <td>{{ employee['email'] }}</td>

                    <td>{{ employee['mobile\_number'] }}</td>

                    <td class="actions">

                        <!-- Edit button -->

                        <a href="{{ url\_for('edit\_employee', id=employee['id']) }}">Update</a>

                        <!-- Delete button -->

                        <form action="{{ url\_for('delete\_employee', id=employee['id']) }}" method="POST"

                            style="display:inline;">

                            <button type="submit"

                                onclick="return confirm('Are you sure you want to delete this user?');">Delete</button>

                        </form>

                    </td>

                </tr>

                {% else %}

                <tr>

                    <td colspan="6">No employees found.</td>

                </tr>

                {% endfor %}

            </tbody>

        </table>

        <!-- Logout Button -->

        <form action="{{ url\_for('logout') }}" method="POST">

            <button type="submit" class="logout-button">Logout</button>

        </form>

    </div>

</body>

</html>

Employee\_dashboard.html

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <title>Employee Dashboard</title>

    <link rel="stylesheet" href="{{ url\_for('static', filename='style.css') }}">

    <style>

        /\* Basic Reset \*/

        \* {

            margin: 0;

            padding: 0;

            box-sizing: border-box;

        }

        body {

            font-family: Arial, sans-serif;

            background-color: #f0f2f5;

            color: #333;

        }

        header {

            background-color: #007bff;

            color: white;

            padding: 20px;

            text-align: center;

            box-shadow: 0 4px 8px rgba(0, 0, 0, 0.1);

        }

        .container {

            width: 90%;

            max-width: 1200px;

            margin: 20px auto;

            padding: 20px;

            background-color: white;

            border-radius: 8px;

            box-shadow: 0 4px 8px rgba(0, 0, 0, 0.1);

        }

        h1,

        h2 {

            color: #007bff;

            margin-bottom: 20px;

        }

        p {

            margin-bottom: 20px;

            font-size: 1.1em;

        }

        table {

            width: 100%;

            border-collapse: collapse;

            margin-bottom: 20px;

        }

        table th,

        table td {

            padding: 15px;

            text-align: left;

            border-bottom: 1px solid #ddd;

        }

        table th {

            background-color: #007bff;

            color: white;

        }

        table tr:nth-child(even) {

            background-color: #f9f9f9;

        }

        .actions {

            display: flex;

            gap: 10px;

        }

        .actions a,

        .actions button {

            text-decoration: none;

            padding: 8px 12px;

            border: none;

            border-radius: 4px;

            color: white;

            cursor: pointer;

            font-size: 14px;

        }

        .actions a {

            background-color: #28a745;

        }

        .actions button {

            background-color: #dc3545;

        }

        .actions a:hover {

            background-color: #218838;

        }

        .actions button:hover {

            background-color: #c82333;

        }

        .logout-button {

            background-color: #007bff;

            border: none;

            color: white;

            padding: 10px 20px;

            font-size: 16px;

            cursor: pointer;

            border-radius: 4px;

            margin-top: 20px;

            display: block;

            text-align: center;

        }

        .logout-button:hover {

            background-color: #0056b3;

        }

    </style>

</head>

<body>

    <header style="color: #ddd;">

        <h1>Employee Dashboard</h1>

    </header>

    <div class="container">

        <p>Know Your Colleagues.</p>

        <p><b><i>VIEW ONLY</i> </b></p>

        <!-- Employee List Section -->

        <h2 style="text-align: center;">All Employees</h2>

        <table>

            <thead>

                <tr>

                    <th>ID</th>

                    <th>Username</th>

                    <th>Role</th>

                    <th>Email</th>

                    <th>Mobile Number</th>

                </tr>

            </thead>

            <tbody>

                {% for employee in employees %}

                <tr>

                    <td>{{ employee['id'] }}</td>

                    <td>{{ employee['username'] }}</td>

                    <td>{{ employee['role'] }}</td>

                    <td>{{ employee['email'] }}</td>

                    <td>{{ employee['mobile\_number'] }}</td>

                </tr>

                {% else %}

                <tr>

                    <td colspan="6">No employees found.</td>

                </tr>

                {% endfor %}

            </tbody>

        </table>

        <!-- Logout Button -->

        <form action="{{ url\_for('logout') }}" method="POST">

            <button type="submit" class="logout-button">Logout</button>

        </form>

    </div>

</body>

</html>

Login.html

<!DOCTYPE html>

<html>

<head>

    <meta charset="UTF-8">

    <title>Login</title>

    <link rel="stylesheet" href="{{ url\_for('static', filename='style.css') }}">

</head>

<body></br></br></br></br></br>

    <div align="center">

        <div align="center" class="border">

            <div class="header">

                <h1 class="word">Login</h1>

            </div></br></br></br>

            <h2 class="word">

                <form action="{{ url\_for('login') }}" method="post">

                    <div class="msg">{{ msg }}</div>

                    <input id="username" name="username" type="text" placeholder="Enter Your Username"

                        class="textbox" /></br></br>

                    <input id="password" name="password" type="password" placeholder="Enter Your Password"

                        class="textbox" /></br></br>

                    <select id="role" name="role" class="dropdown"

                        style="padding: 5px; font-weight: bold; border-radius: 6px;">

                        <option value="employee">Employee</option>

                        <option value="admin">Admin</option>

                    </select></br></br>

                    <input type="submit" class="btn" value="Sign In"></br></br>

                </form>

            </h2>

            <p class="bottom">Don't have an account? <a class="bottom" href="{{ url\_for('register') }}">Sign Up here</a>

            </p>

        </div>

    </div>

</body>

</html>

Register.html

<!DOCTYPE html>

<html>

<head>

    <meta charset="UTF-8">

    <title>Register</title>

    <link rel="stylesheet" href="{{ url\_for('static', filename='style.css') }}">

</head>

<body></br></br></br></br></br>

    <div align="center">

        <div align="center" class="border">

            <div class="header">

                <h1 class="word">Register</h1>

            </div></br></br></br></br>

            <h2 class="word">

                <form action="{{ url\_for('register') }}" method="post">

                    <div class="msg">{{ msg }}</div>

                    <input id="username" name="username" type="text" placeholder="Enter Your Username"

                        class="textbox" /></br></br>

                    <input id="password" name="password" type="password" placeholder="Enter Your Password"

                        class="textbox" /></br></br>

                    <select id="role" name="role" class="dropdown"

                        style="padding: 5px; font-weight: bold; border-radius: 6px;">

                        <option value="employee">Employee</option>

                        <option value="admin">Admin</option>

                    </select></br></br>

                    <input type="submit" class="btn" value="Sign Up"></br></br>

                </form>

            </h2>

            <p class="bottom">Already have an account? <a class="bottom" href="{{ url\_for('login') }}">Sign In here</a>

            </p>

        </div>

    </div>

</body>

</html>

Edit\_employee.html

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <title>Update Employee</title>

    <link rel="stylesheet" href="{{ url\_for('static', filename='style.css') }}">

    <style>

        body {

            font-family: Arial, sans-serif;

            background-color: #f0f2f5;

            color: #333;

            margin: 0;

            padding: 20px;

        }

        header {

            background-color: #007bff;

            color: white;

            padding: 20px;

            text-align: center;

            box-shadow: 0 4px 8px rgba(0, 0, 0, 0.1);

            border-radius: 8px;

            margin-bottom: 20px;

        }

        .container {

            max-width: 600px;

            margin: 0 auto;

            background-color: white;

            padding: 20px;

            border-radius: 8px;

            box-shadow: 0 4px 8px rgba(0, 0, 0, 0.1);

        }

        h1 {

            color: #007bff;

            margin-bottom: 20px;

        }

        form {

            display: flex;

            flex-direction: column;

        }

        label {

            font-weight: bold;

            margin-bottom: 5px;

        }

        input[type="text"],

        select {

            padding: 10px;

            border: 1px solid #ddd;

            border-radius: 4px;

            margin-bottom: 15px;

            font-size: 16px;

        }

        input[type="text"]::placeholder {

            color: #aaa;

        }

        button {

            background-color: #007bff;

            border: none;

            color: white;

            padding: 10px 20px;

            font-size: 16px;

            cursor: pointer;

            border-radius: 4px;

            margin-top: 10px;

        }

        button:hover {

            background-color: #0056b3;

        }

        .back-link {

            display: block;

            margin-top: 20px;

            text-align: center;

            color: #007bff;

            text-decoration: none;

            font-size: 16px;

        }

        .back-link:hover {

            text-decoration: underline;

        }

    </style>

    <script>

        // Function to show an alert and then redirect

        function showAlertAndRedirect(message, redirectUrl) {

            if (message) {

                alert(message);

                setTimeout(function () {

                    window.location.href = redirectUrl;

                }, 1500); // Redirect after 1.5 seconds

            }

        }

    </script>

</head>

<body onload="showAlertAndRedirect('{{ msg }}', '{{ url\_for('admin\_dashboard') }}')">

    <header>

        <h1>Edit Employee</h1>

    </header>

    <div class="container">

        <form method="POST">

            <label for="username">Username:</label>

            <input type="text" id="username" name="username" value="{{ employee['username'] }}" required>

            <label for="role">Role:</label>

            <select id="role" name="role">

                <option value="admin" {% if employee['role']=='admin' %}selected{% endif %}>Admin</option>

                <option value="employee" {% if employee['role']=='employee' %}selected{% endif %}>Employee</option>

            </select>

            <label for="password">Password:</label>

            <input type="text" id="password" name="password" placeholder="Leave blank to keep current password">

            <label for="email">Email:</label>

            <input type="text" id="email" name="email" value="{{ employee['email'] }}" required>

            <label for="mobile\_number">Mobile Number:</label>

            <input type="text" id="mobile\_number" name="mobile\_number" value="{{ employee['mobile\_number'] }}" required>

            <button type="submit">Update</button>

        </form>

        <a href="{{ url\_for('admin\_dashboard') }}" class="back-link">Back to Dashboard</a>

    </div>

</body>

</html>

Style.css

/\* Store this code in 'style.css' file inside the 'static' folder\*/

.header {

    padding: 5px 120px;

    width: 150px;

    height: 70px;

    background-color: #236B8E;

}

.border {

    padding: 80px 50px;

    width: 400px;

    height: 450px;

    border: 1px solid #236B8E;

    border-radius: 0px;

    background-color: #9AC0CD;

}

.btn {

    padding: 10px 40px;

    background-color: #236B8E;

    color: #FFFFFF;

    font-style: oblique;

    font-weight: bold;

    border-radius: 10px;

}

.textbox {

    padding: 10px 40px;

    background-color: #ffffff;

    border-radius: 10px;

}

::placeholder {

    color: #0a0202;

    opacity: 1;

    font-style: oblique;

    font-weight: bold;

}

.word {

    color: #f1e8e8;

    font-style: oblique;

    font-weight: bold;

}

.bottom {

    color: #236B8E;

    font-style: oblique;

    font-weight: bold;

}

.msg {

    color: red;

    font-weight: bold;

}

.textbox {

    width: 100%;

    padding: 10px;

    margin: 5px 0;

    border-radius: 5px;

    border: 1px solid #ccc;

}

.btn {

    background-color: #4CAF50;

    color: white;

    padding: 10px 20px;

    border: none;

    border-radius: 5px;

    cursor: pointer;

}

.btn:hover {

    background-color: #45a049;

}

.bottom {

    font-size: 14px;

}

Outputs -

Login Page

A screenshot of a computer

Description automatically generated

Register Page

A screenshot of a computer

Description automatically generated

Admin Dashboard-

A screenshot of a computer

Description automatically generated

Update Employee-

A computer screen shot of a computer screen

Description automatically generated

Employee Dashboard-

A screenshot of a computer

Description automatically generated

Database – Employees Table-

A screen shot of a computer

Description automatically generated