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Lohegaon, Pune**

**Department of Computer Engineering
SE SEM-II**

**A PBL Presentation
on**

Title of PBL Project

Employee Management System

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Introduction

This project aims to develop a user-friendly and efficient **Employee Management System (EMS)** utilizing **Django** (a Python web framework), **SQLite3** (a lightweight database management system), and front-end technologies like **HTML**, **CSS**, **Bootstrap**, and **JavaScript**. The system will serve as a centralized platform for managing essential employee data and streamlining administrative tasks within an organization.

Aim & Objective

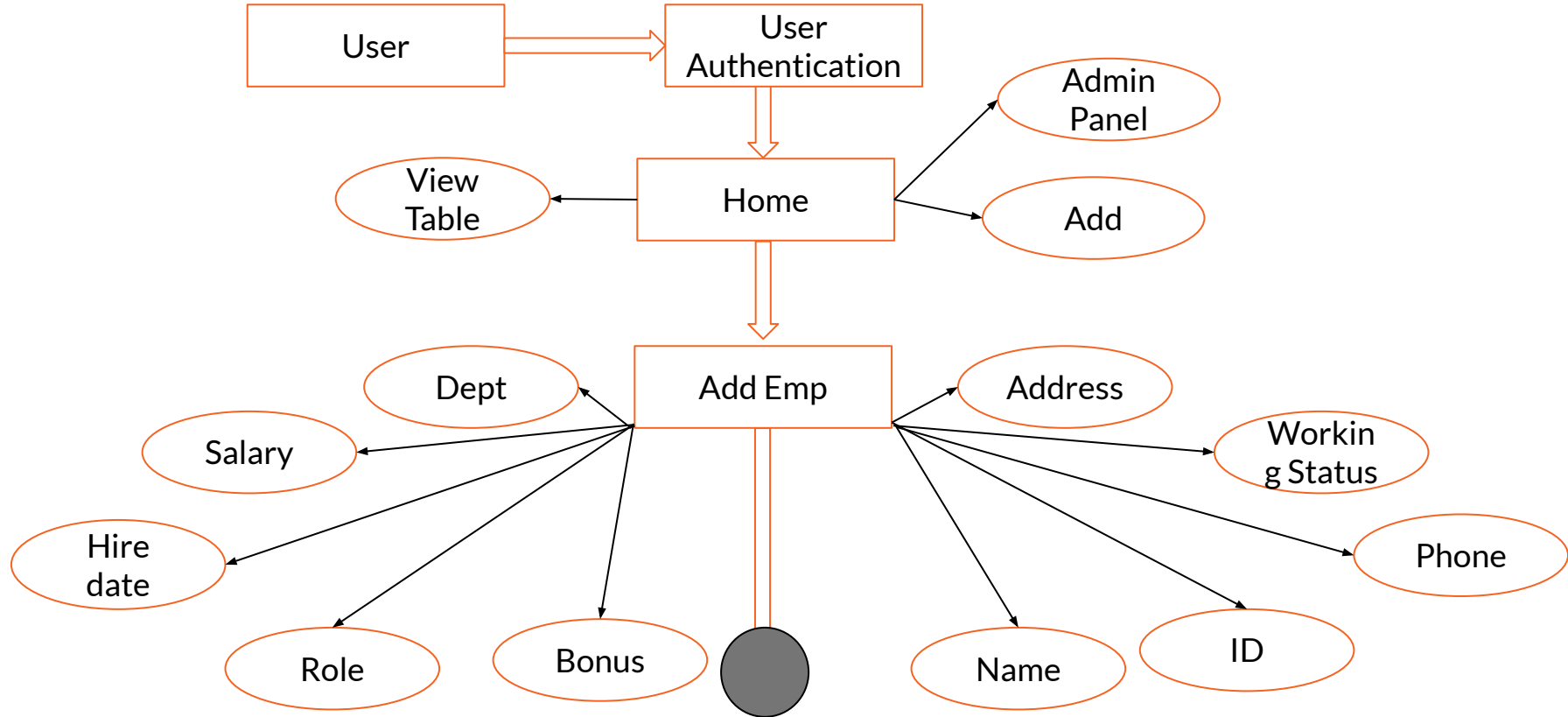
The primary aim of this project is to develop a **comprehensive and user-friendly web-based Employee Management System (EMS)** to streamline employee data management and administrative processes within an organization.

To facilitate efficient data management by enabling users to create, view, update, and delete employee records as needed.

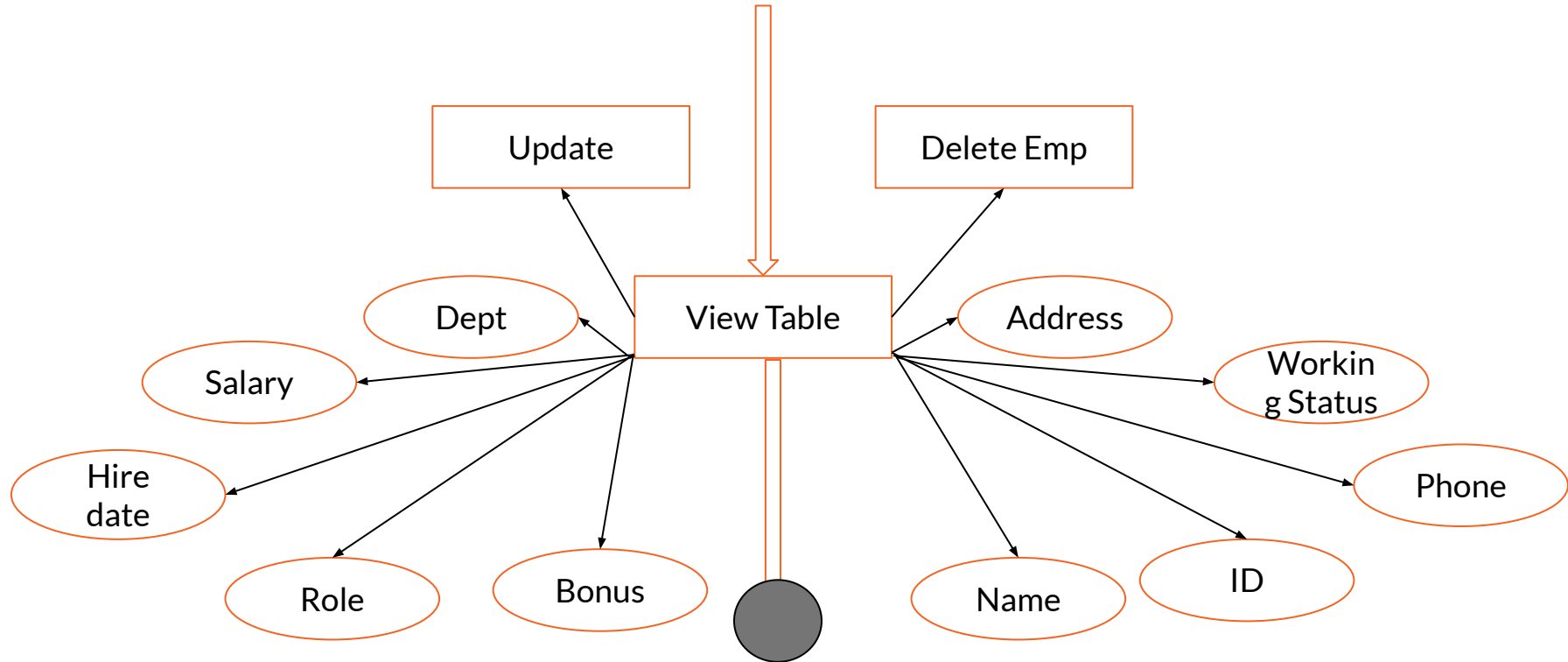
Literature Survey

Study Title	Authors	Year	Methodology	Key Findings
"Effectiveness of Web-based HR Management Systems"	Smith, J. & Johnson, A.	2020	Survey & Case Study	Increased efficiency, better employee engagement
"User Satisfaction with Online Employee Management Tools"	Lee, S. & Brown, T.	2018	Questionnaire & Interviews	High Satisfaction, ease of use
"Security Concerns in Web-based HR Platforms"	Patel, R. & Chen, Y.	2021	Literature Review & Case Study	Identified security vulnerabilities, recommendations for improvement

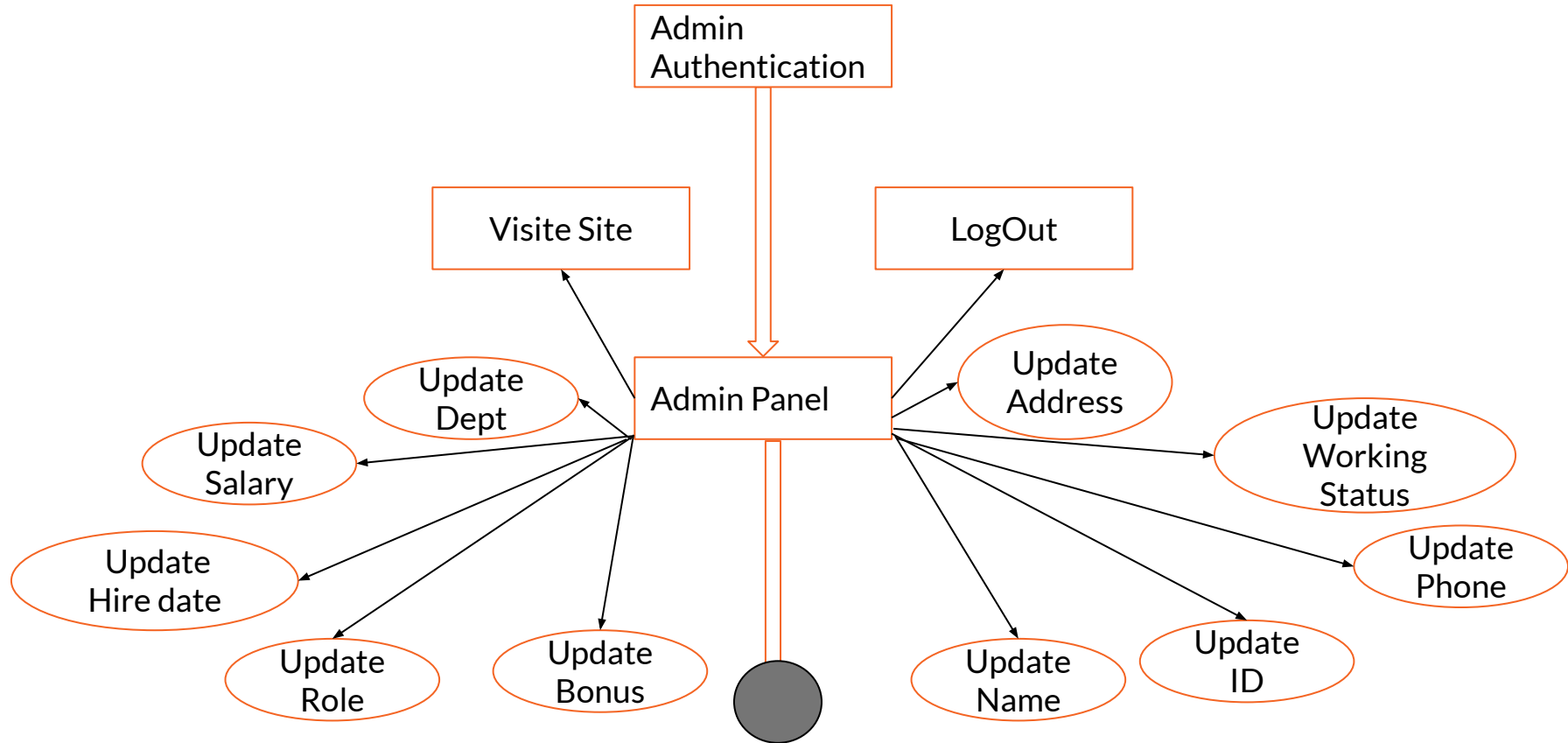
System Architecture



System Architecture



System Architecture



Algorithm

PBKDF2

(Password-Based Key Derivation Function 2)

- A unique, random value called a salt is generated.
- The employee's password is concatenated (combined) with the salt.
- This combined value is hashed using a secure one-way hashing function like SHA-256.(Secure Hash Algorithm 256-bit).SHA-256 always produces a 256-bit (32-byte) hash value.
- The hashing process is repeated multiple times (iterations). This repetition is what makes password cracking computationally expensive. The number of iterations is configurable in Django's settings.

Techniques Used

Front-End Development

HTML: The fundamental building block for structuring the web page content and defining the overall layout.

CSS: Styles the visual elements of the web pages, including fonts, colors, layouts, and responsiveness across different devices.

Bootstrap: A popular CSS framework providing pre-built components and styles for faster development and responsive design.

JavaScript: Adds interactivity to the frontend, enabling features like form validation, dynamic content updates, and asynchronous communication with the backend.

Techniques Used

Back-End Development

Python: The primary programming language for the backend, chosen for its readability, versatility, and extensive libraries.

Django Framework: A high-level Python web framework providing structure, security features, and pre-built functionalities for web development, simplifying development efforts.

Techniques Used

Database Management

SQLite3: A lightweight, embedded relational database management system chosen for its ease of use, efficiency, and suitability for smaller to medium-sized applications.

Hardware & Software Requirements

Hardware

Processor: Intel Core i3 or AMD Ryzen 3 processor (or equivalent) or better for smooth development and operation.

RAM: 8 GB RAM for efficient multitasking during development and system usage.

Storage: 50 GB of free disk space to accommodate the operating system, development environment, and project files.

Display: A monitor with a resolution of at least 1080p (1920 x 1080) for comfortable development and system use.

Hardware & Software Requirements

Software

- **Operating System:**
 - **Development:** Windows 10 or 11, macOS (latest version), or Linux (Ubuntu, Debian etc.) - Choose the operating system you're comfortable with for development.
 - **Deployment:** The system can be deployed on various platforms depending on your needs. Some options include:
 - Local server setup (e.g., Apache, Nginx) on a dedicated machine for hosting the system within your organization.

Hardware & Software Requirements

Software

Programming Language: Python 3.x (latest stable version) is required for development.

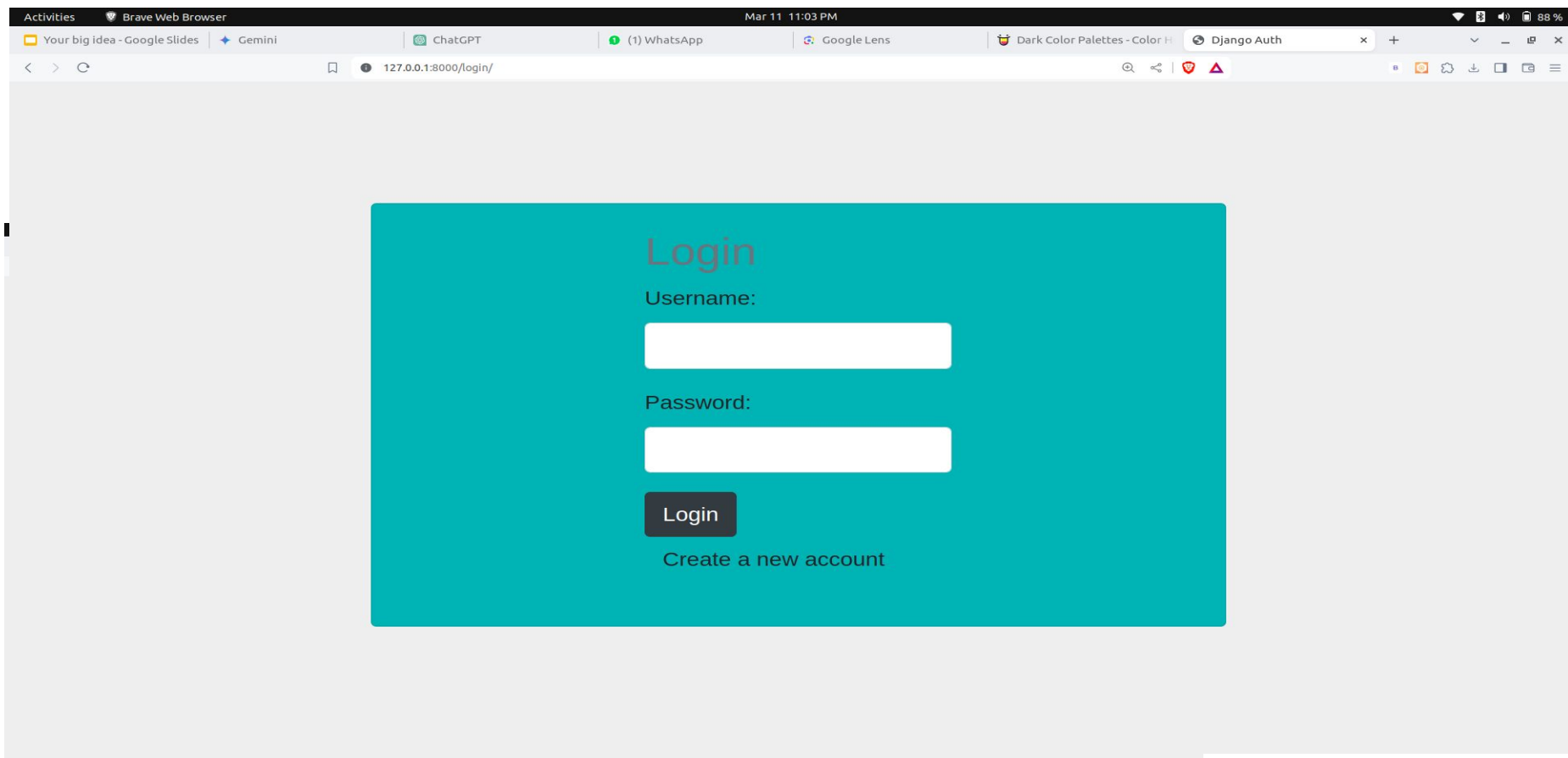
Web Framework: Django framework (latest stable version) for building the backend of the application.

Database Management System: SQLite3 is used for data storage in this project. However, for deployment, you may choose a more robust database management system like MySQL or PostgreSQL depending on your needs and scalability requirements.

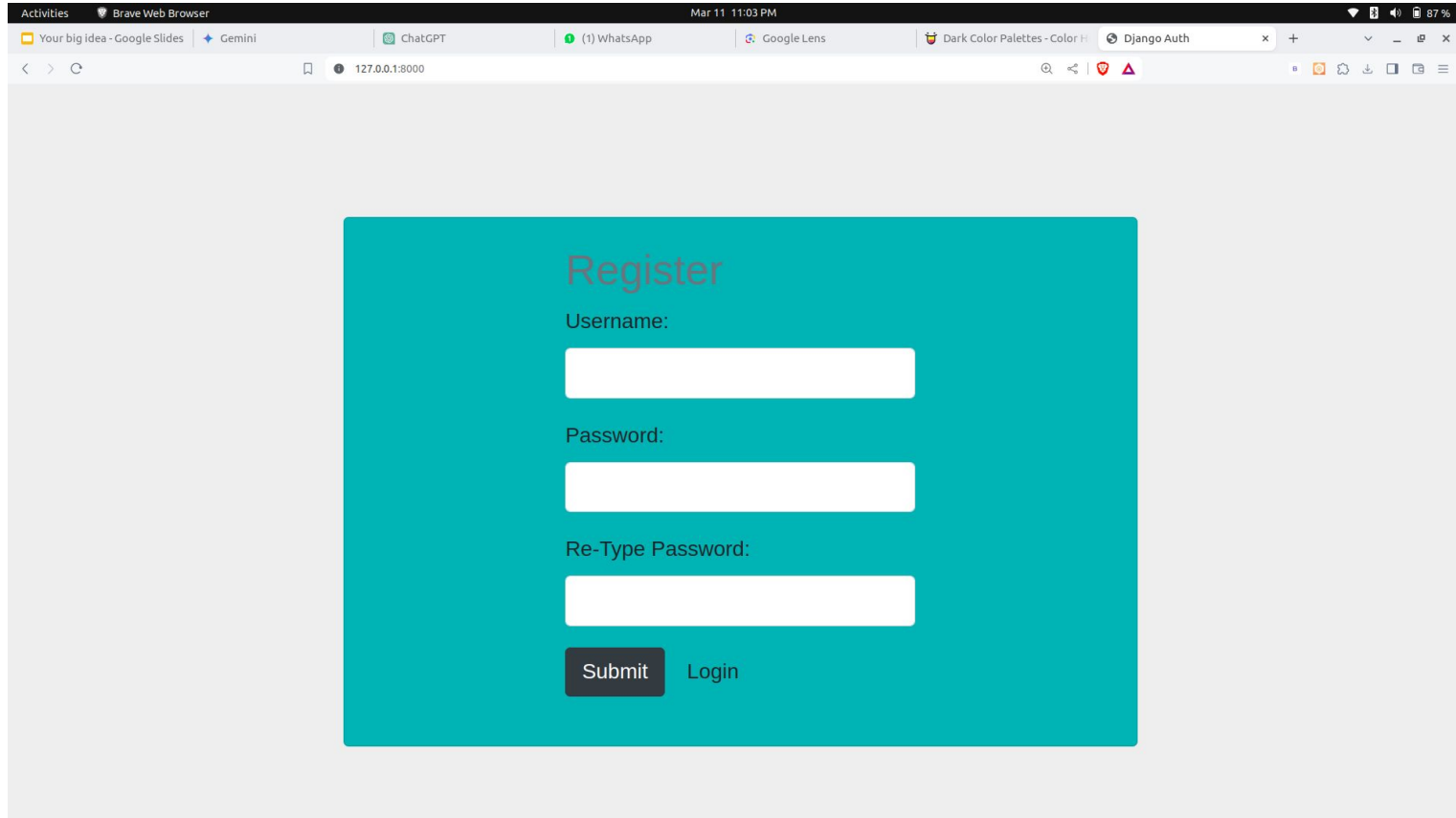
Text Editor or IDE: Any text editor like Sublime Text, Visual Studio Code, or an Integrated Development Environment (IDE) like PyCharm or IntelliJ IDEA can be used for writing Python code.

Web Browser: A recent version of Google Chrome, Mozilla Firefox, or any other popular web browser to access and test the web application.

Login Page



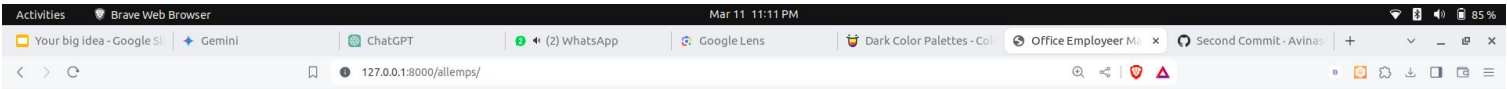
Registration



The screenshot shows a Brave Web Browser window with the title 'Django Auth'. The address bar displays '127.0.0.1:8000'. The main content area features a teal-colored registration form with the following elements:

- Register**: A large heading at the top of the form.
- Username:**: A label followed by a white text input field.
- Password:**: A label followed by a white text input field.
- Re-Type Password:**: A label followed by a white text input field.
- Submit**: A dark gray button with white text.
- Login**: A dark gray button with white text, positioned to the right of the Submit button.

View All Employee's



View Add Search Edit

All Employee Detail's

Sr no.	Emp id	First Name	Last Name	Salary	Dept	Role	Location	Phone	Joining Date
1	6	Avinash	Markad	35000	.Net Engg	Python Devloper	Pune	8329954030	March 8, 2024

Add Employee's

Activities Brave Web Browser Mar 11 11:12 PM

Your big idea - Google Slides Gemini ChatGPT (2) WhatsApp Google Lens Dark Color Palettes - Col Office Employee M Second Commit - Avina

127.0.0.1:8000/addEmp/

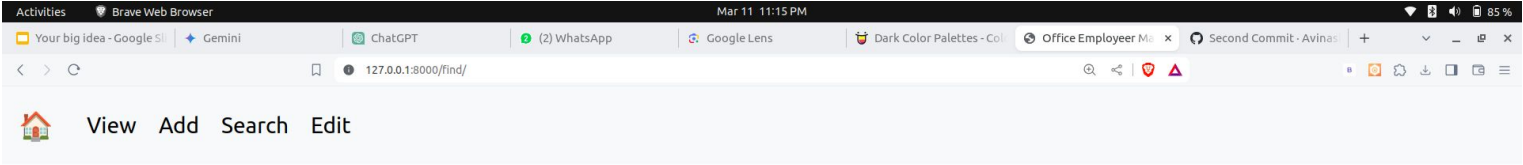
View Add Search Edit

Add Employee Detail's

First Name	Last Name
<input type="text"/>	<input type="text"/>
Phone	Joining date
<input type="text"/>	<input type="text" value="dd/mm/yyyy"/>
Salary	Bonus
<input type="text"/>	<input type="text"/>
Department	Role
<input type="text" value="Select Department"/>	<input type="text" value="Select Role"/>

Submit

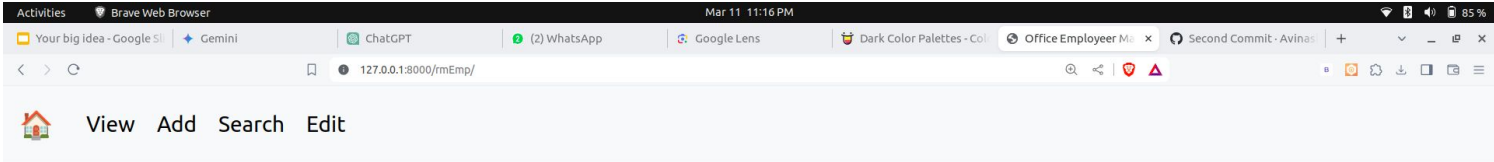
Search an Employee



Search Employee Detail's

Sr no.	Emp id	First Name	Last Name	Salary	Dept	Role	Location	Phone	Joining Date
1	6	Avinash	Markad	35000	.Net Engg	Python Devloper	Pune	8329954030	March 8, 2024


Edit an Employee Details



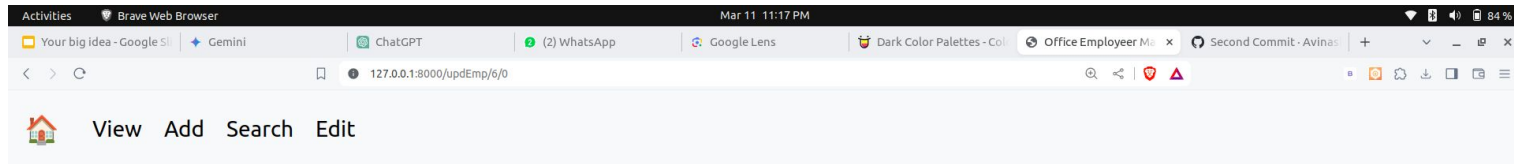
Edit Or Delete Employee Detail's

Emp ID/ First Or Last Name / Department

Search

Sr no.	Emp id	First Name	Last Name	Salary	Dept	Role	Location	Phone	Joining Date	Action
1	6	Avinash	Markad	35000	.Net Engg	Python Developer	Pune	8329954030	March 8, 2024	 Edit

Update & Delete Employee Data



Avinash Markad Detail's

First Name

Avinash

Last Name

Markad

Phone

8329954030

Joining date

March 8, 2024

Salary

35000

Bonus

3000

Department

.Net Engg Pune

Role

Python Devloper

Update

Delete

Back

Admin Authentication

Activities Brave Web Browser Mar 11 11:08 PM

Your big idea - Google Slides Gemini ChatGPT (1) WhatsApp Google Lens Dark Color Palettes - Color Log in | Django site admin

127.0.0.1:8000/dashboard/admin/login/?next=/dashboard/admin/

Django administration

You are authenticated as raam, but are not authorized to access this page. Would you like to login to a different account?

Username:

Password:

Log in

Admin Panel

The screenshot displays the Django administration interface in a Brave Web Browser. The browser's address bar shows the URL `127.0.0.1:8000/dashboard/admin/`. The page title is "Django administration". In the top right corner, a welcome message reads "WELCOME, AVINASH." followed by links for "VIEW SITE", "CHANGE PASSWORD", and "LOG OUT".

The main content area is titled "Site administration" and is divided into two primary sections: "AUTH_APP" and "AUTHENTICATION AND AUTHORIZATION".

AUTH_APP

Item	+ Add	Change
Departments	+ Add	Change
Employees	+ Add	Change
Roles	+ Add	Change

AUTHENTICATION AND AUTHORIZATION

Item	+ Add	Change
Groups	+ Add	Change
Users	+ Add	Change

Recent actions

My actions

- [Employee object \(6\)](#)
Employee
- [avinash](#)
User
- [+ Employee object \(8\)](#)
Employee
- [+ Employee object \(3\)](#)
Employee
- [+ Full-Stack Developer](#)
Role
- [+ Back-End Developer](#)
Role
- [+ Front-End Developer](#)
Role
- [+ MERN Devloper](#)
Role

Admin Panel

Activities Brave Web Browser Mar 11 11:24 PM

Your big idea - Google Slides Gemini ChatGPT (2) WhatsApp Google Lens Dark Color Palettes - Col Site administration | x Second Commit - Avinash +

127.0.0.1:8000/dashboard/admin/

Django administration

WELCOME, AVINASH. [VIEW SITE](#) / [CHANGE PASSWORD](#) / [LOG OUT](#)

Site administration

AUTH_APP	
Departments	+ Add Change
Employees	+ Add Change
Roles	+ Add Change

AUTHENTICATION AND AUTHORIZATION	
Groups	+ Add Change
Users	+ Add Change

Recent actions

My actions

- [Employee object \(6\)](#)
Employee
- [avinash](#)
User
- [+ Employee object \(8\)](#)
Employee
- [+ Employee object \(3\)](#)
Employee
- [+ Full-Stack Developer](#)
Role
- [+ Back-End Developer](#)
Role
- [+ Front-End Developer](#)
Role
- [+ MERN Developer](#)
Role

Admin Panel

Activities Brave Web Browser Mar 11 11:27 PM

Your big idea - Google Slides Gemini ChatGPT (2) WhatsApp Google Lens Dark Color Palettes - Color Select user to change Second Commit - Avinash

127.0.0.1:8000/dashboard/admin/auth/user/

Django administration

WELCOME, AVINASH. [VIEW SITE](#) / [CHANGE PASSWORD](#) / [LOG OUT](#)

Home > Authentication and Authorization > Users

Start typing to filter...

- AUTH_APP
- Departments + Add
- Employees + Add
- Roles + Add

AUTHENTICATION AND AUTHORIZATION

- Groups + Add
- Users + Add

Select user to change

ADD USER +

Search

Action: ----- Go 0 of 7 selected

<input type="checkbox"/>	USERNAME	EMAIL ADDRESS	FIRST NAME	LAST NAME
<input type="checkbox"/>	TestUser			
<input type="checkbox"/>	avinash	avim@gmail.com	Avinash	Markad
<input type="checkbox"/>	omkar			
<input type="checkbox"/>	raam			
<input type="checkbox"/>	ram			
<input type="checkbox"/>	user			
<input type="checkbox"/>	usertest			

7 users

FILTER

↓ By staff status

All
Yes
No

↓ By superuser status

All
Yes
No

↓ By active

All
Yes
No

Admin Panel

Activities Brave Web Browser Mar 11 11:29 PM

Your big idea - Google Slides Gemini ChatGPT (2) WhatsApp Google Lens Dark Color Palettes - Color Select role to change x Second Commit - Avina

127.0.0.1:8000/dashboard/admin/auth_app/role/

Django administration

WELCOME, AVINASH. VIEW SITE / CHANGE PASSWORD / LOG OUT

Home > Auth_App > Roles

Start typing to filter...

AUTH_APP

Departments + Add

Employees + Add

Roles + Add

AUTHENTICATION AND AUTHORIZATION

Groups + Add

Users + Add

Select role to change

ADD ROLE +

Action: ----- Go 0 of 7 selected

<input type="checkbox"/>	ID	NAME
<input type="checkbox"/>	7	Full-Stack Developer
<input type="checkbox"/>	6	Back-End Developer
<input type="checkbox"/>	5	Front-End Developer
<input type="checkbox"/>	4	MERN Developer
<input type="checkbox"/>	3	.Net Developer
<input type="checkbox"/>	2	JAVA Developer
<input type="checkbox"/>	1	Python Developer

7 roles

Admin Panel

Activities Brave Web Browser Mar 11 11:31 PM

Your big idea - Google Slides Gemini ChatGPT (2) WhatsApp Google Lens Dark Color Palettes - Col Select department to change Second Commit - Avinash

127.0.0.1:8000/dashboard/admin/auth_app/department/

Django administration

WELCOME, AVINASH. VIEW SITE / CHANGE PASSWORD / LOG OUT

Home > Auth_App > Departments

Start typing to filter...

AUTH_APP

Departments + Add

Employees + Add

Roles + Add

AUTHENTICATION AND AUTHORIZATION

Groups + Add

Users + Add

Select department to change

ADD DEPARTMENT +

Action: ----- Go 0 of 8 selected

<input type="checkbox"/>	ID	NAME	LOCATION
<input type="checkbox"/>	11	Tech	Pune
<input type="checkbox"/>	10	.Net Engg	Pune
<input type="checkbox"/>	9	User Interface	Pune
<input type="checkbox"/>	8	Quality Assurance	Pune
<input type="checkbox"/>	7	Information Security	Pune
<input type="checkbox"/>	6	Information Technology	Pune
<input type="checkbox"/>	5	Software Development	Pune
<input type="checkbox"/>	4	HR	Pune

8 departments

127.0.0.1:8000/dashboard/admin/auth_app/department/?o=2

Admin Panel

Activities Brave Web Browser Mar 11 11:33 PM 81%

Your big idea - Google Slides Gemini ChatGPT (2) WhatsApp Google Lens Dark Color Palettes - Col Employee object (6) x Second Commit - Avinash +

127.0.0.1:8000/dashboard/admin/auth_app/employee/s/change/

Start typing to filter...

AUTH_APP

Departments + Add

Employees + Add

Roles + Add

AUTHENTICATION AND AUTHORIZATION

Groups + Add

Users + Add

Change employee

HISTORY

Employee object (6)

FirstName: Avinash

LastName: Markad

Phone: 8329954

Salary: 35000

Bonus: 3000

HireDate: 2024-03-08 Today |

Note: You are 5.5 hours ahead of server time.

Dept: .Net Engg Pune

Role: Python Developer

Conclusion

This project has explored the design and development of a web-based Employee Management System (EMS) using Python, Django, SQLite3, HTML, CSS, Bootstrap, and JavaScript. The system offers a user-friendly interface for managing essential employee information, including Name, ID, Address, Phone Number, Working Status, Department, Salary, Role, and Bonus (optional).

The project prioritizes data security through a secure login mechanism and utilizes Django's authentication system and role-based access control. By centralizing employee data and streamlining administrative tasks, this system aims to improve data accuracy, efficiency, accessibility, and overall organizational effectiveness.

Future Scope

Performance Evaluation.

Communication Tools.

Attendance Tracking using Facial Recognition.

Mobile App Development

References

- <https://docs.djangoproject.com/en/5.0/intro/tutorial01/>
- <https://getbootstrap.com/docs/5.3/getting-started/introduction/>

Thank You
