A

Mini Project Report

on

Job Matrix

Submitted in partial fulfillment of the requirements for the

degree

Second Year Engineering – Computer Science Engineering (Data Science)

by

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CERTIFICATE

This to certify that the Mini Project report on "Job Matrix" has been submitted by Shaily Gupta (23107087), Vishal Gupta (23107139), Sakshi Jadhav (23107110) and Mayur Gosavi (23107092) who are bonafide students of A. P. Shah Institute of Technology, Thane as a partial fulfillment of the requirement for the degree in **Computer Science Engineering (Data Science)**, during the academic year **2024-2025** in the satisfactory manner as per the curriculum laid down by University of Mumbai.

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ACKNOWLEDGEMENT”

This project would not have come to fruition without the invaluable help of our guide **Ms. Aavani N**. Expressing gratitude towards our HoD, **Ms. Anagha Aher**, and the Department of Computer Science Engineering (Data Science) for providing us with the opportunity as well as the support required to pursue this project. We would also like to thank our project coordinator **Ms. Richa Singh.** who gave us her valuable suggestions and ideas when we were in need of them. We would also like to thank our peers for their helpful suggestions.

TABLE OF CONTENTS

Chapter 1

Introduction

In the digital era, employment ecosystems are rapidly evolving, with technology playing a pivotal role in bridging the gap between job seekers and employers. However, despite the growth of online job portals, many candidates still face challenges in navigating fragmented job listings, inconsistent application processes, and poor communication with recruiters. On the other hand, employers continue to struggle with managing high volumes of applications, manually sorting through candidate data, and maintaining efficient hiring workflows.

To address these critical issues, Job Matrix has been developed as a comprehensive job application portal that brings together all essential aspects of the recruitment process under one unified platform. This system has been built using Python's Tkinter library for the GUI, offering a simple yet intuitive user experience, and MySQL as the backend database to handle data storage, job listings, applications, and user management.

The portal is designed with two main user groups in mind—job seekers and employers:

- **Job Seekers** can create profiles, search for relevant job openings based on job titles or locations, upload their resumes, and track the status of their applications in real-time.
- **Employers** can register on the portal, post job vacancies, view applicants, accept or reject candidates, and manage the recruitment pipeline efficiently from a centralized interface.

Traditional recruitment practices, such as sending resumes through email or using scattered job boards, are time-consuming and error-prone. Moreover, without a streamlined process, both parties suffer from delays and missed opportunities. *Job Matrix* eliminates these hurdles by digitizing and automating the hiring workflow. It ensures faster communication, greater transparency, and improved efficiency in managing job applications.

By combining essential features like job search filters, resume uploads, application tracking, and hiring status management, Job Matrix aims to redefine how recruitment is handled at both small and large scales. It serves as a stepping stone towards smarter, technology-driven hiring solutions that are accessible, reliable, and efficient.

1.1. Purpose:

The Job Matrix portal is designed with the central purpose of simplifying and improving the job application and recruitment process for both job seekers and employers. It aims to address the inefficiencies, time-consuming tasks, and disorganized systems that are prevalent in traditional job-hunting and recruitment methods. Below are the key purposes of the portal:

- **Simplify the Job Search Process for Job Seekers:** The primary purpose of Job Matrix is to provide job seekers with an easy-to-use platform to quickly find and apply for relevant job opportunities using advanced search filters. It simplifies the job search process by centralizing listings in one place.
- **Streamline the Application Process for Employers:** By enabling them to post job vacancies, review candidate applications, and track the progress of hiring, the portal provides a centralized, easy-to-use tool for managing recruitment activities.
- **Enhance Communication and Collaboration:** The portal enables smooth communication between job seekers and employers, allowing applicants to receive application status updates and interact with employers for interviews or further details.
- **Improve Job Seekers' Access to Career Opportunities:** The platform supports individuals from different backgrounds, industries, and experience levels, creating an inclusive environment for both entry-level candidates and seasoned professionals.
- **Support Job Seekers and Employers with Real-Time Data:** Job seekers can assess which jobs are most relevant to their profiles, while employers can analyze the types of candidates that fit best for their job openings.

1.2. Problem Statement:

The current job application and recruitment processes are often inefficient and fragmented, with job seekers struggling to find relevant opportunities and employers facing challenges

in managing and tracking numerous applications. Job seekers must browse multiple platforms, while employers waste time sorting through applications manually. There is a lack of a centralized, user-friendly platform that facilitates seamless communication, simplifies the job search, and streamlines the recruitment process for both parties. This results in delays, missed opportunities, and a less organized approach to job hunting and hiring.

1.3. Objectives:

The primary objective of the Job Matrix project is to develop an efficient, user-friendly job application portal that streamlines the job search and recruitment process for both job seekers and employers. Key objectives include:

- **To develop an efficient platform for job applications and recruitment:** Create a complete desktop application using Python (Tkinter) for GUI and MySQL (8.0.39) for managing all data operations.
- **To allow users to search and apply for jobs easily:** Implement job search functionality with filter options (e.g., job title, location) using Python (Tkinter) to enhance user experience.
- **To enable companies to review applications and make hiring decisions:** Provide features for recruiters to view, accept, or reject applications through a GUI built in Tkinter and data managed in MySQL.
- **To provide a structured job management system for both parties:** Develop a well-organized interface for both job seekers and recruiters to manage postings and applications efficiently.

1.4. Scope:

The scope of the Job Matrix project includes the development of a comprehensive job application portal designed to simplify and improve the job search and recruitment process for both job seekers and employers. The specific scope includes:

The platform will be accessible to job seekers and companies.

- **Job Seekers**: Job seekers will have the ability to browse the platform easily from any device, including desktops and mobile phones. They will access a user-friendly interface that allows them to search for jobs, upload resumes, and interact with companies. The platform will be designed with an intuitive layout, enabling job seekers to quickly understand how to apply for jobs and stay updated on new opportunities .

- **Companies**: Employers (companies) will have their own dedicated section of the platform to post job listings, view applications, and manage recruitment processes. Companies can sign up for an account, set up a company profile, and start posting jobs right away. The platform will also provide companies with tools to track applicants, filter resumes, and communicate with candidates.

- Users can register, create profiles, and apply for jobs. Registration: Both job seekers and companies will be able to sign up for the platform by providing basic details like name, email, password, and in some cases, a company or personal verification step. This registration process is streamlined and user-friendly.

- Companies can post job listings and manage applicants. Job Listings: Employers will have the ability to post new job openings with detailed descriptions about the role, required qualifications, job location, compensation range, and other key details. Employers can also edit or delete job postings as needed, ensuring their listings are up-to-date.

Admin functionalities for system monitoring and maintenance

- **System Monitoring**: Admins will have access to the back-end of the platform, where they can monitor platform performance, including traffic, user activity, and other metrics. This allows them to ensure that the platform runs smoothly, identifying and fixing any technical issues promptly. They can also access logs and generate reports on platform usage.

- **User Management**: Admins can manage both job seekers' and companies' accounts. This includes verifying accounts, disabling or blocking suspicious accounts, and

handling any disputes or issues that arise. They can also help with account recovery in case a user forgets their password or encounters other problems.

- **Content Moderation**: Admins will review and approve content such as job listings, company profiles, and user posts to ensure that everything meets platform guidelines. This moderation ensures that there is no inappropriate or fraudulent content on the site, creating a safe and trustworthy environment.
- **System Maintenance**: Admins will be responsible for running updates, performing system backups, and addressing any bugs or performance issues. They will also be responsible for ensuring that the platform complies with relevant laws and regulations.

Chapter 2

Proposed System

The proposed system for the Job Matrix portal is designed to provide a seamless and efficient platform for job seekers and employers to connect, communicate, and manage the job application process. The system will be a desktop-based application built using Python Tkinter for the user interface and MySQL for the backend database.

The Job Matrix portal is designed to streamline the job search and recruitment process.

- **Job Seeker Module**: Job seekers can register, create profiles, search jobs based on filters, apply directly, track application statuses, and communicate with employers.
- **Employer Module:** Employers can register, post job vacancies, manage applications, track candidate progress, and communicate with job seekers.
- **Database & Backend**: The system uses MySQL for data storage and ensures secure storage with encryption and password hashing.
- **User Interface**: A simple and intuitive Python Tkinter interface allows smooth navigation with personalized dashboards for job seekers and employers.

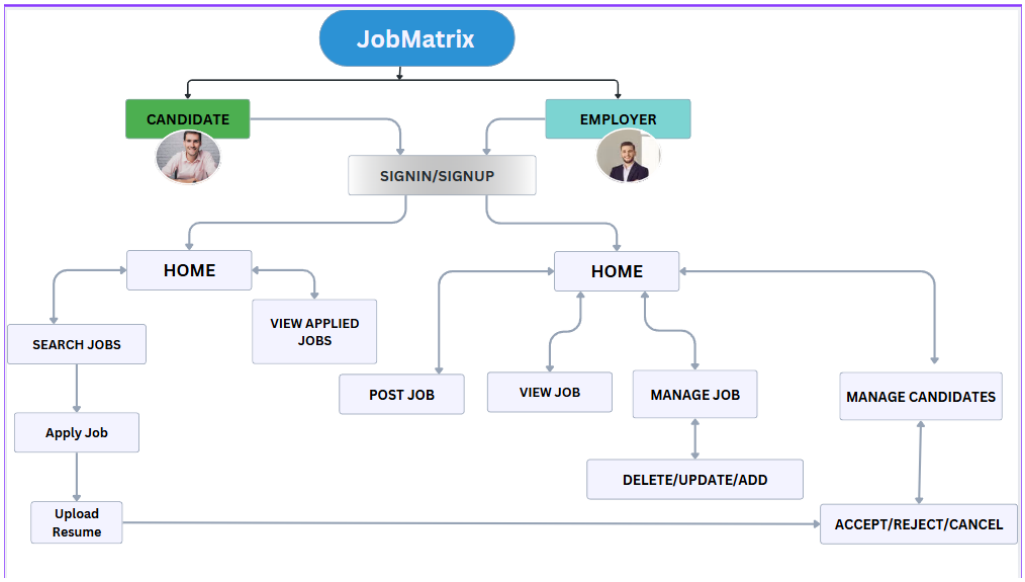

Figure 2.1: Block Diagram

The block diagram Figure 2.1 of the Job Matrix illustrates the overall workflow between the user interface, application logic, and database. The system begins with two main user types: Job Seekers and Employers. These users interact with the system through a graphical interface built using Python's Tkinter library.

All user actions—such as registration, login, job posting, or job application—are handled by the Application Logic, which is written in Python. This layer performs all the internal processing like input validation, decision making, and preparing SQL queries.

2.1. Features and Functionality:

This system is built to streamline the job search and recruitment process for both job seekers and recruiters. By providing easy-to-use tools for registration, profile creation, job search, application submission, and candidate management, the platform ensures a seamless and efficient experience for all users, the Job Matrix platform offers all the necessary resources to facilitate and enhance the recruitment journey, making it quicker and more effective for everyone involved. As the platform evolves, additional features and improvements will continue to be integrated to further optimize the hiring process and keep it aligned with the ever-changing demands of the job market.

User & Recruiter Registration & Profile Management:

- Both job seekers and recruiters must register to access the platform.
- Job seekers can create profiles, upload resumes, and update personal details, while recruiters can set up company profiles and job postings.

Job Search & Application:

- Job seekers can browse available jobs, filter by category, location, and experience, and apply with a single click. They can also track the status of their applications. Recruiter Job Management.

Recruiter Job Management:

- Recruiters can post job openings, manage applications, review candidate profiles, and accept or reject applications based on suitability.

Chapter 3

Project outcomes

The system resulted in the successful development of a functional online platform that facilitates job postings by employers and job applications by seekers. The system effectively simulates a real-world job portal by allowing users to register, log in, post or apply for jobs, and manage their interactions through a secure and user-friendly interface. Through this project, key concepts of database design, and user management were applied in a practical context. The final product serves as a working prototype that can be scaled or enhanced for real-time use, demonstrating both technical skills and problem-solving abilities.

- **Simplified Job Search & Recruitment Process**: Job seekers can find jobs quickly using personalized filters. They can easily submit application and track their application status. Streamlined communication between job seekers and employers via messaging. By getting notifications user both can get updated on application progress.
- **Employer Features**: Employers can manage and track candidate applications efficiently. Streamlined hiring process through easy candidate management.
- **Centralized Job Listings**: One-stop solution for job seekers and employers. Intuitive platform interface for easy navigation.
- **Data Security**: Data encryption and secure access controls ensure user data protection.
- **Personalized Job Matching**: Job seekers receive relevant job recommendations based on qualifications. Personalized job alerts to ensure seekers never miss opportunities.

Chapter 4

Software Requirements

To design and implement the Job Matrix, the following software requirements were used. These tools and technologies provided a stable development environment and helped in building a responsive and functional application.

- **Python (Tkinter**): Tkinter is used to create the front-end GUI of the Job Matrix portal, providing an intuitive interface for job seekers and employers to interact with the platform. It allows easy navigation between features like job search, application tracking, and profile management.
- **MySQL for database**: MySQL serves as the back-end database to store essential data such as job listings, user profiles, and application statuses. It ensures secure and organized data management, supporting scalable growth.
- **pyMySQL**: PyMySQL connects the Python application with MySQL, enabling efficient database operations like retrieving job listings, submitting applications, and managing user data. It allows seamless interaction between the front-end and back-end of the portal

Chapter 5

Project Design

Project design refers to the process of conceptualizing and planning the structure, components, and functionalities of a project to achieve specific objectives. It involves translating the requirements and goals identified during the initial phases (such as requirement analysis) into a detailed blueprint or roadmap for implementation. It is a visual representation that models the interactions between users admin and a system, describing its functionality and behavior from the user as well as admin perspective.

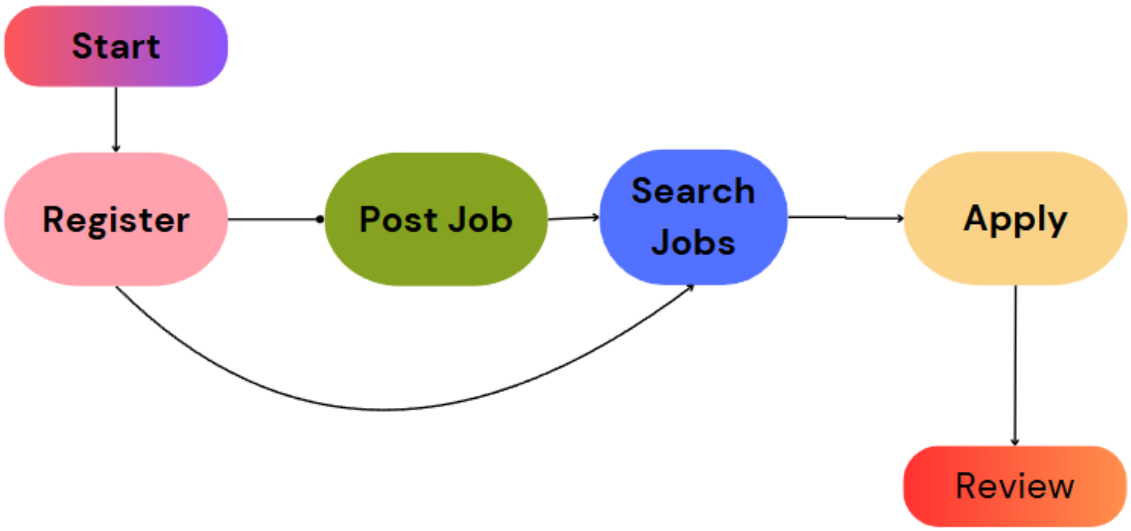

Figure 5.1: Workflow

This workflow illustrates the user journey in a job application platform. Users start by registering on the platform. Recruiters can post jobs after registration. Job seekers search for jobs, apply, and their applications are reviewed. There are loops to ensure users are registered before accessing key features.

Chapter 6

Project Scheduling

A schedule outlining planned start and finish dates, durations, and allocated resources for each task, ensuring tasks are completed on time and within budget for effective task and time management.

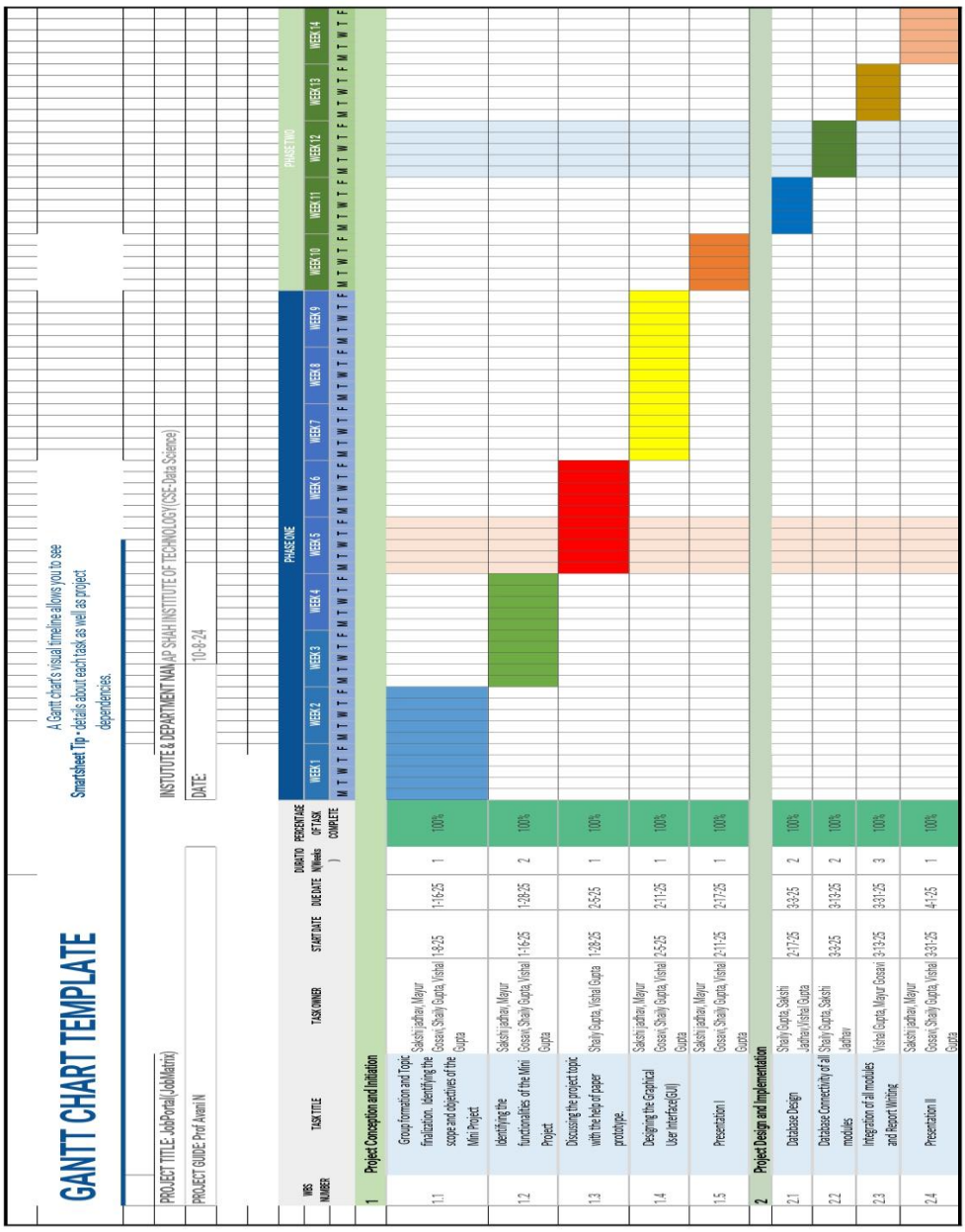

Figure 6.1: Gantt Chart

During the project timeline, the group members undertook various tasks to ensure the successful completion of the Mini Project. In the first two weeks of January, Shaily Gupta and Vishal Gupta focused on group formation and topic finalization, identifying the project's scope and objectives. Following this, from the last week of January to the first week of February, Shaily Gupta and Vishal Gupta identified the key functionalities needed for the Mini Project. From the second week to the last week of February, a collaborative effort involving Shaily Gupta, Vishal Gupta, Sakshi Jadhav and Mayor Gosavi was made to discuss the project topic, utilizing a paper prototype to visualize ideas. Concurrently, Vishal Gupta and Sakshi Jadhav worked on designing the Graphical User Interface (GUI) during the last week of February to the first week of March, focusing on creating a user-friendly layout. In the first two weeks of March, the team, including Shaily Gupta, Vishal Gupta, Sakshi Jadhav and Mayor Gosavi, prepared for Presentation I. Vishal Gupta then took the lead from the second week to the last week of March, concentrating on database design, which was crucial for the project's functionality. By the last week of March, Shaily Gupta completed the database connectivity for all modules, ensuring seamless integration. In the first week of April, Vishal Gupta and Sakshi Jadhav worked together to integrate all project modules and began report writing, while Mayor Gosavi joined them for Presentation II in the same week. This structured approach allowed the team to efficiently collaborate and advance their project systematically.

Chapter 7

Result

The mini project titled "Job Matrix" has been successfully implemented with all the planned features and functionality. The system was built to serve two types of users—job seekers and employers—each having a distinct role in the platform. Job seekers were able to register, log in, create and update profiles, upload resumes, and apply for jobs posted by employers. Employers, on the other hand, could create accounts, post job listings, and view applications submitted by job seekers.

The mini project "Job Matrix", developed using Python Tkinter for the frontend and MySQL for the backend, was successfully implemented and tested. The system allowed two types of users: job seekers and employers, each with their own set of features and functionalities.

Job seekers were able to register, log in, view available job listings, and apply for suitable jobs through a clean and easy-to-use graphical interface. Employers were able to post new jobs, view applicants, and manage listings directly through the application. All forms and interactions were handled using Tkinter widgets, which provided a smooth desktop experience.

The backend connectivity using MySQL ensured that all data such as user accounts, job postings, and applications were stored and retrieved accurately. The application used Python's mysql-connector library to perform operations like data insertion, update, delete, and fetching records. Data validation and error handling were also implemented to make the system more reliable.

The system was tested with multiple users and sample data. It successfully handled registration, login, form submissions, and data updates without any major issues. The database structure was normalized and designed to support future scalability.

In conclusion, the system achieved all its basic functionalities and performed efficiently during testing. The integration of Tkinter with MySQL proved to be effective for building a simple and responsive desktop-based Job Matrix.

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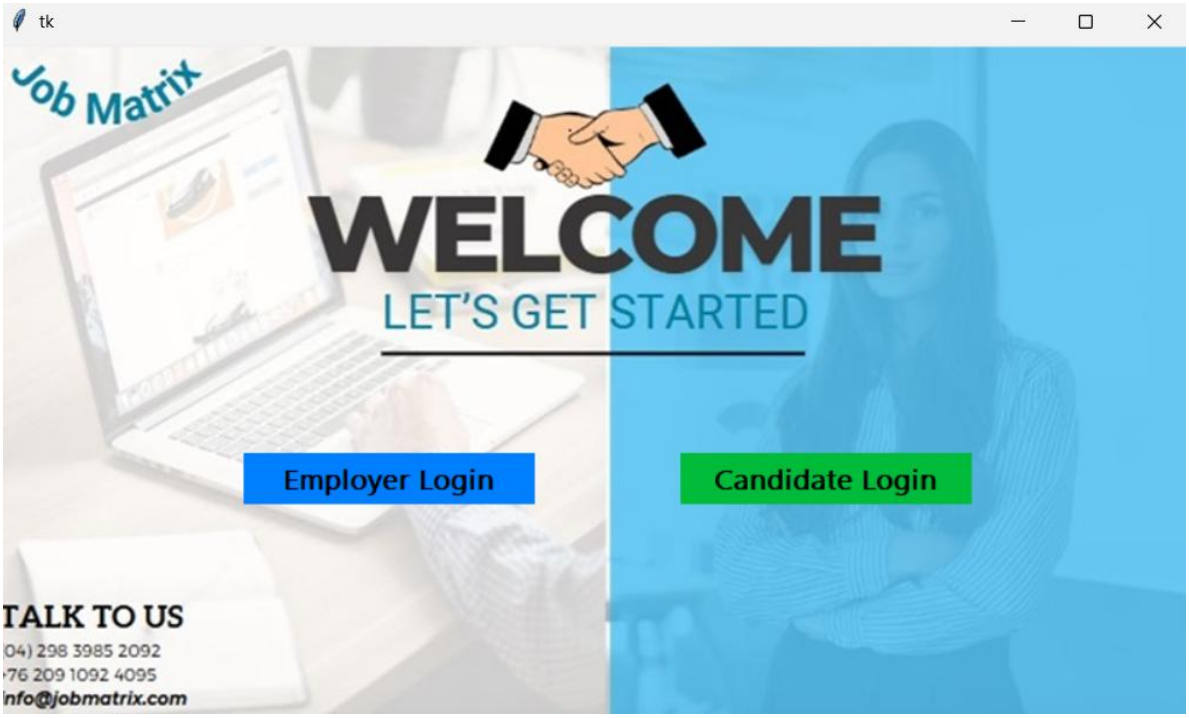

Figure 7.1: Welcome page

This is the welcome page for Employer and Candidate.

Figure 7.2: Candidate sign in

After signing up the Candidate had to put same username and password for enter to next page.

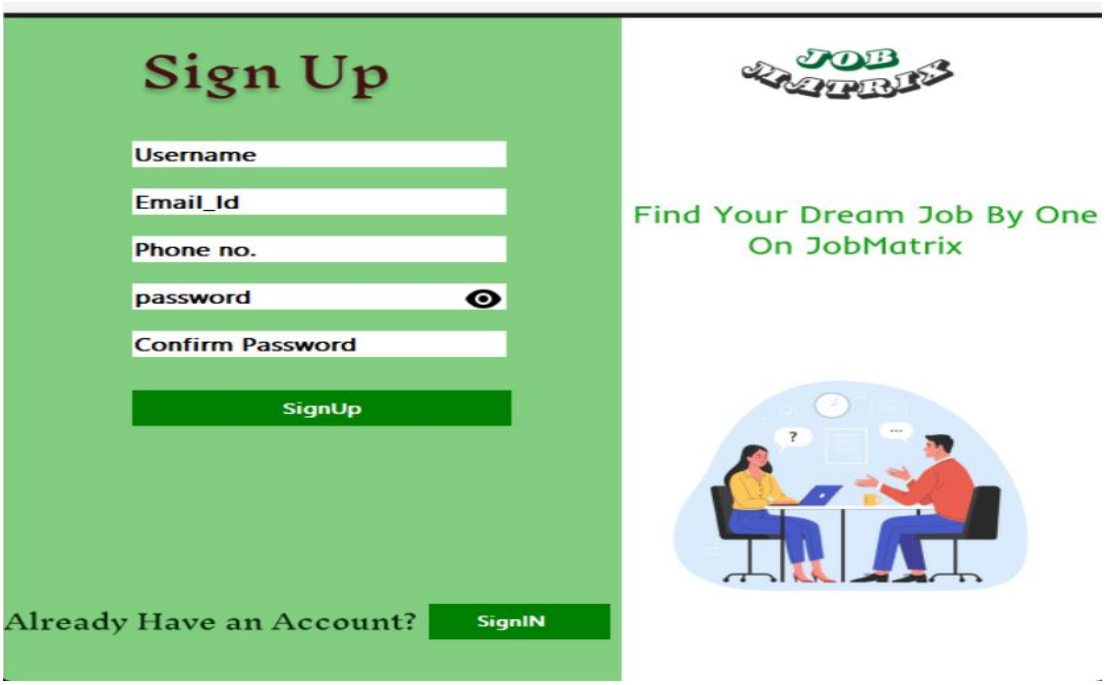

Figure 7.3: Candidate sign up

This page is for Candidate signup where user can signup with proper validation to enter in.

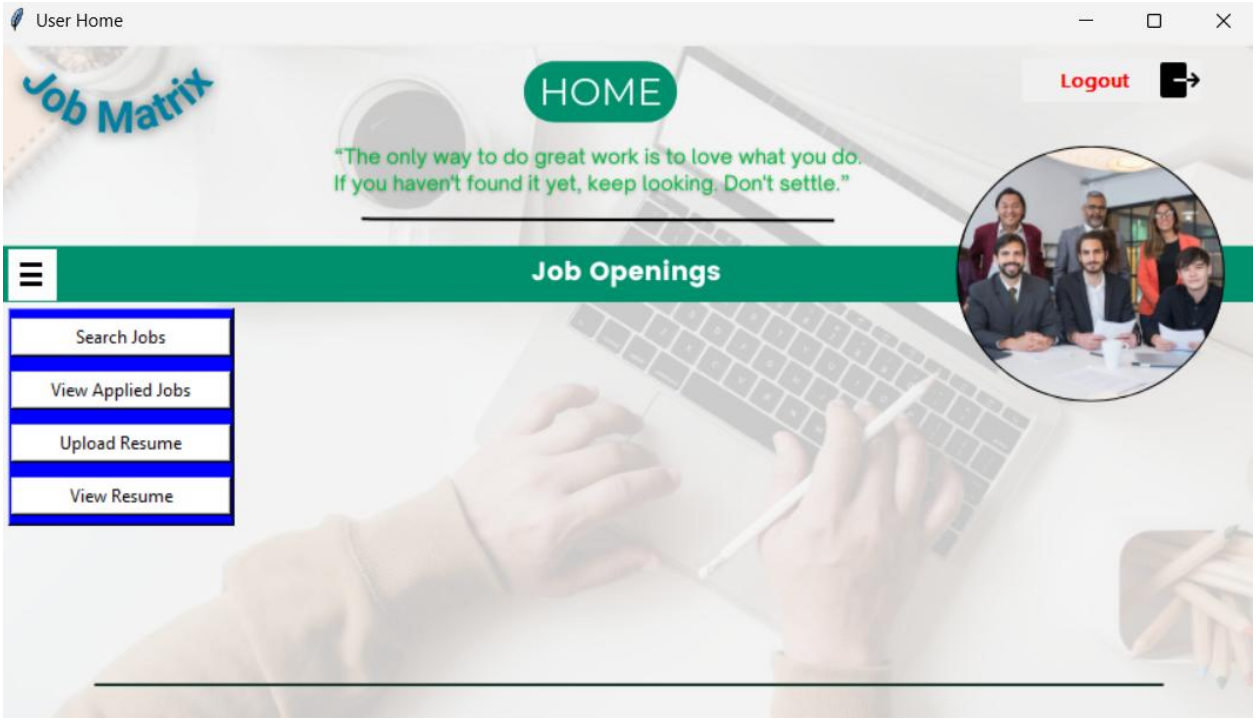

Figure 7.4: Candidate home page

This a home page of Candidate where candidate can look and apply for job.

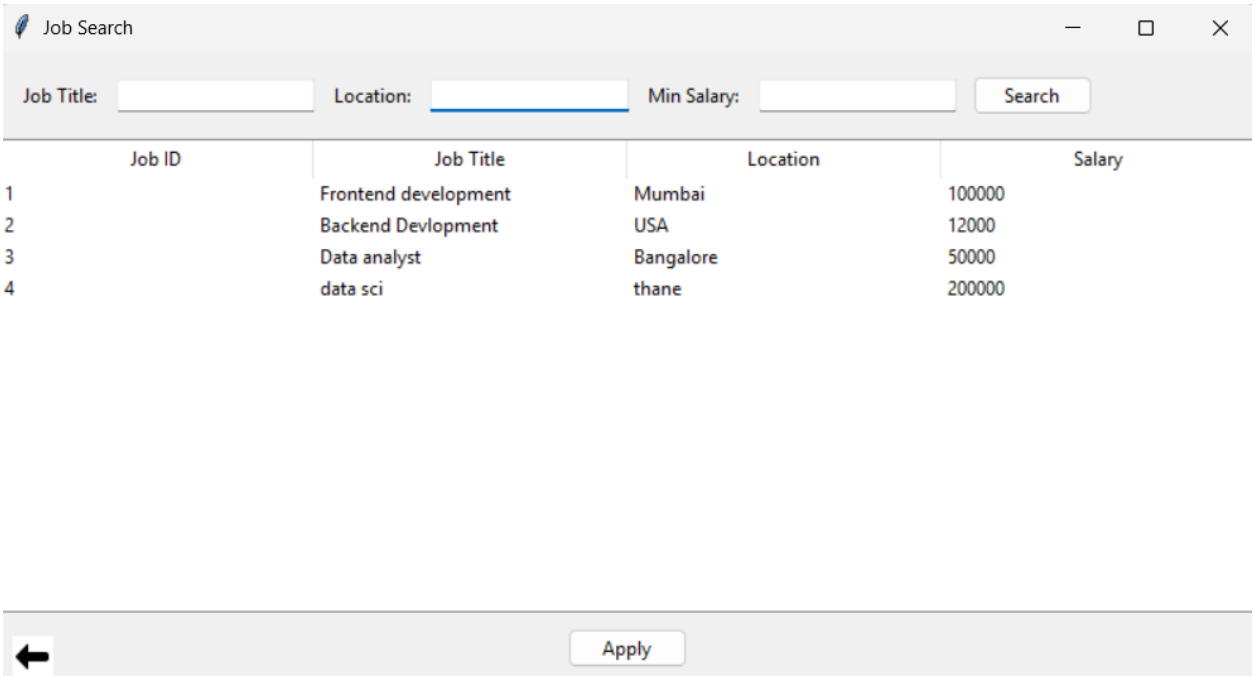

Figure 7.7: Job Search

This is the page where candidate can filter and search categories wise jobs.

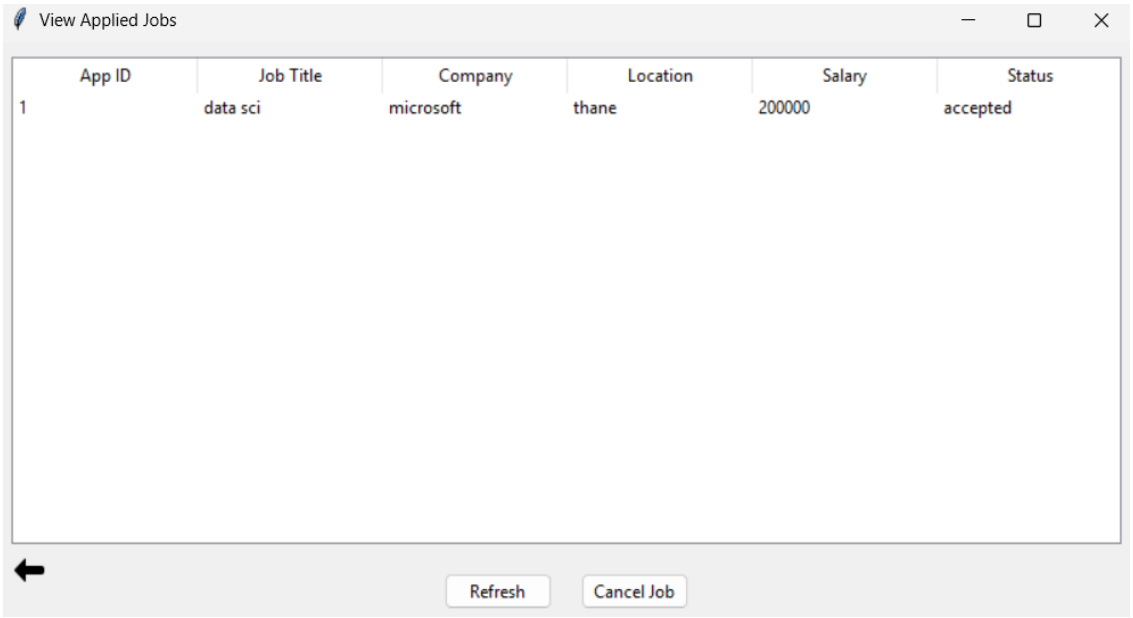

Figure 7.6 : View Applied Job

This page shows the jobs candidate has applied for.

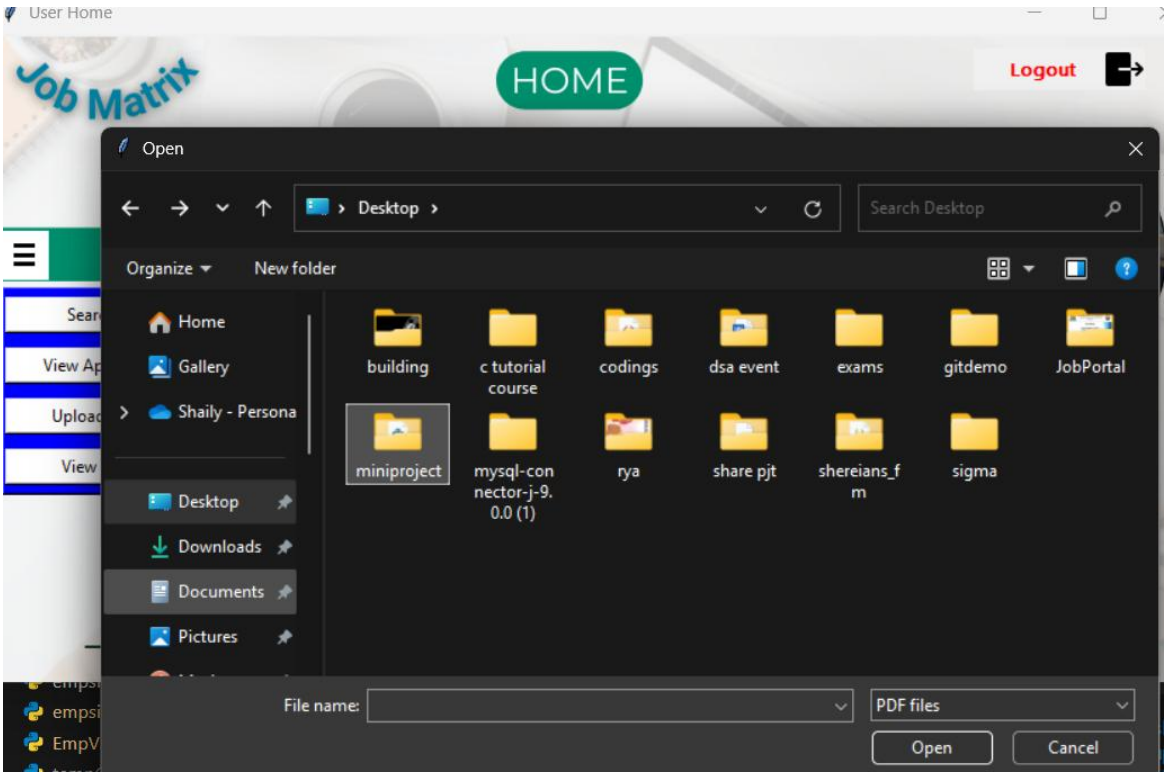

Figure 7.7: Upload Resume

This page shows the process of uploading Candidate Resume.

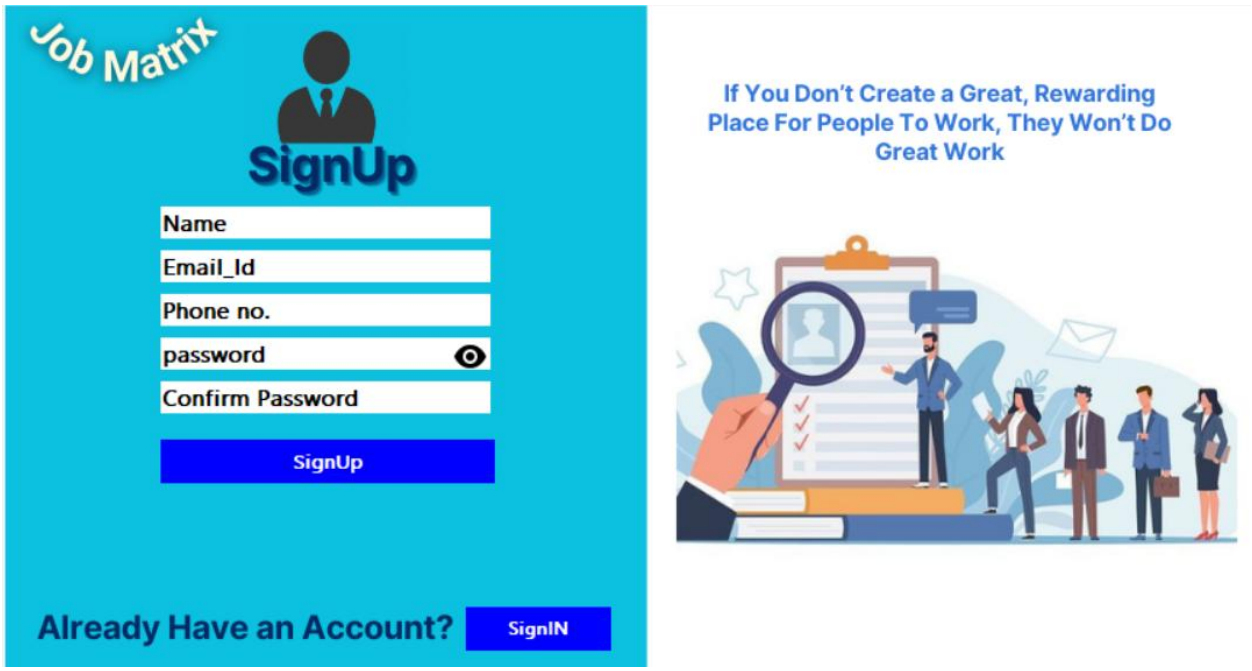

Figure 7.8: Employer Signup

This page is for Employer signup where Employer can signup with proper validation.

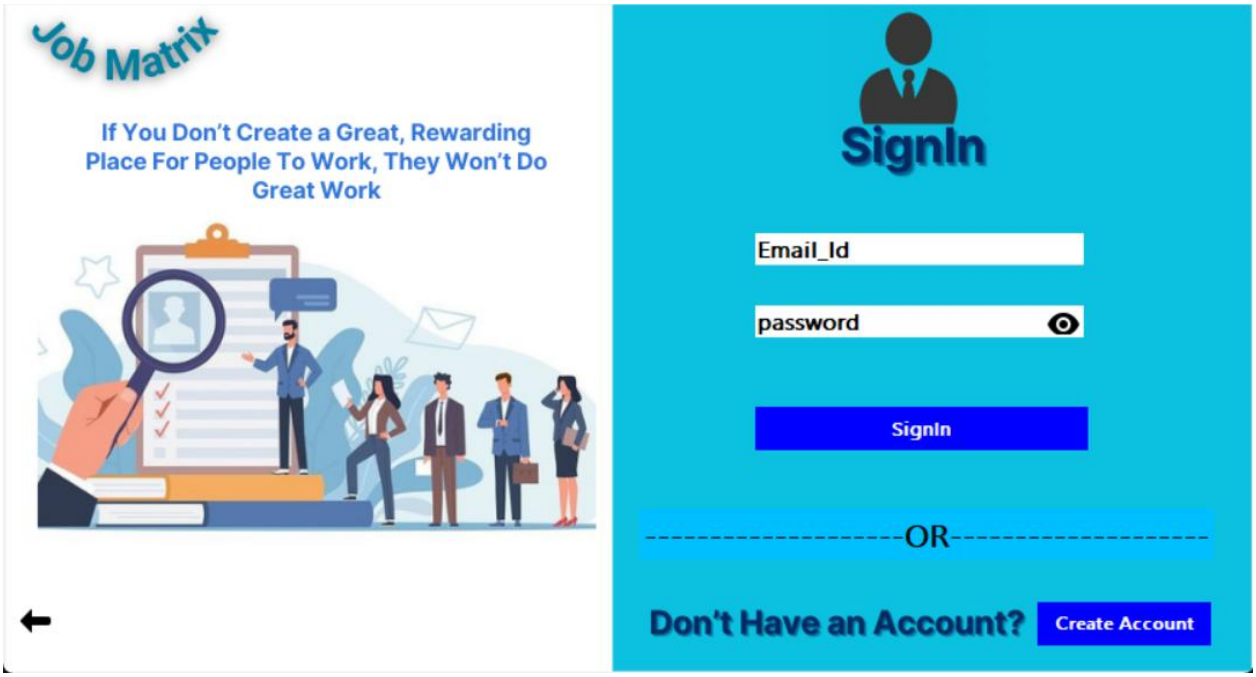

Figure 7.9: Employer sign in

After signing up the Employer had to put same username and password for enter to next page.

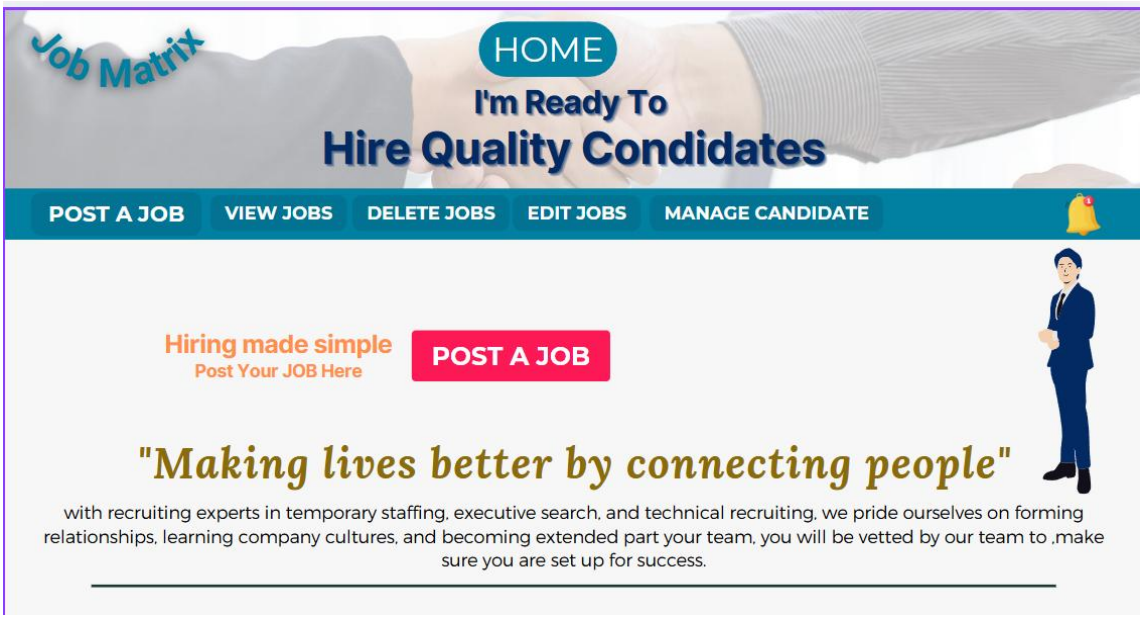

Figure 7.10: Employer home page

This is a home page for Employer where he/she can manage jobs by adding, updating, deleting.

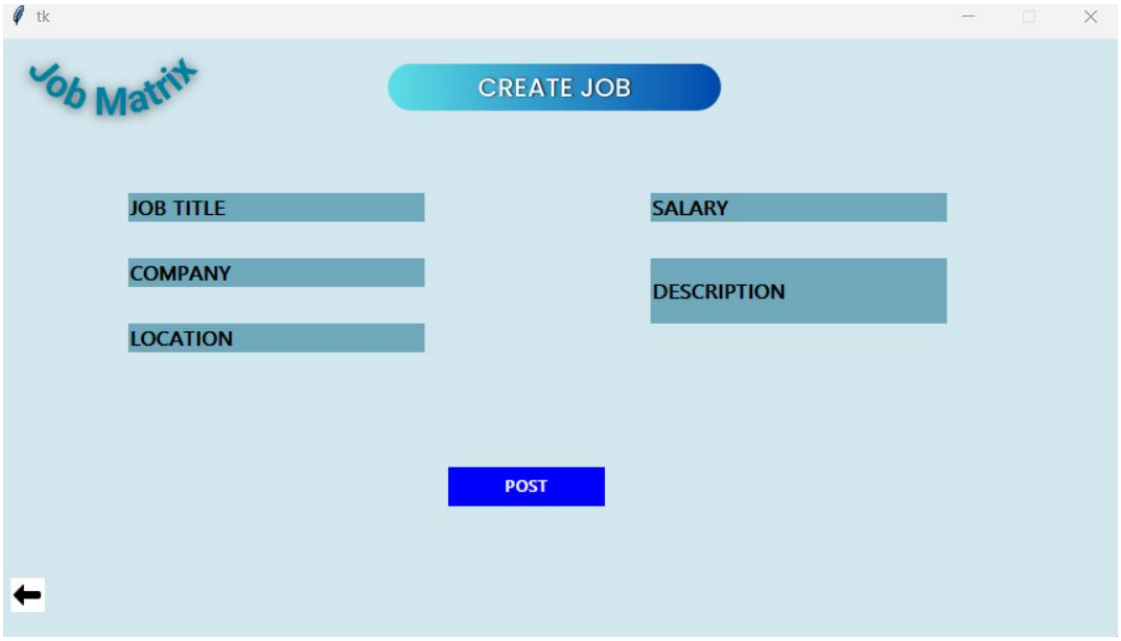

Figure 7.11: Create A Job

This is the page where Employer can post their job vacancies.

Figure 7.12: Available job Listing

This is the page where Employer can look for his/her posted jobs.

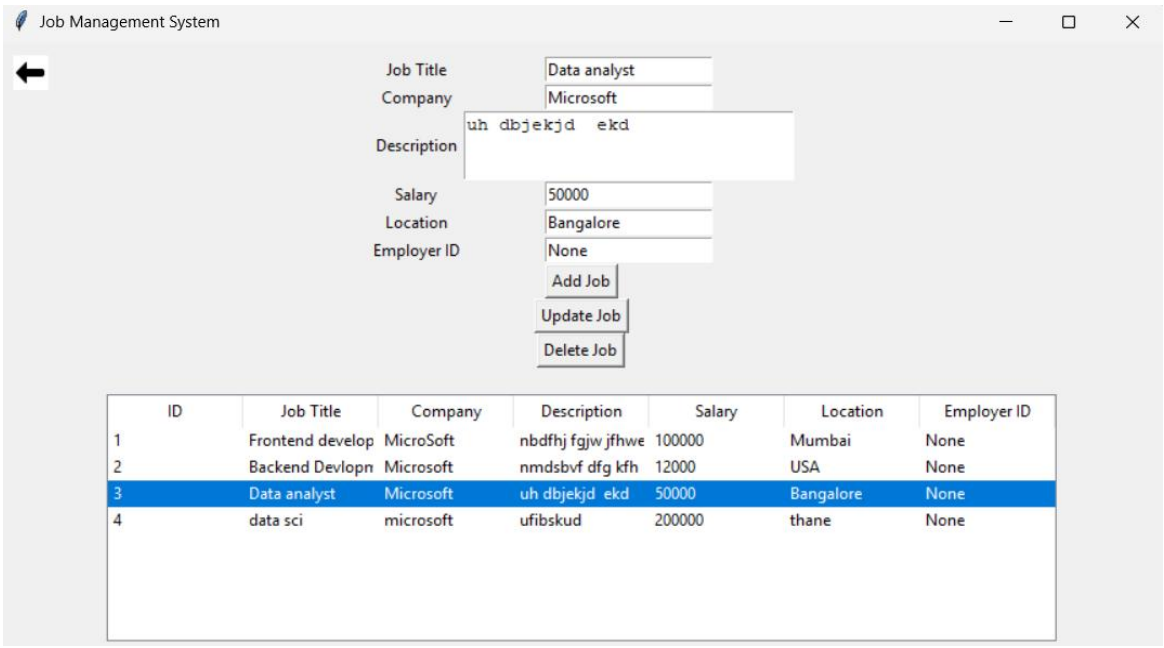

Figure 7.13: Manage jobs

This page allows to update and delete posted jobs if required.

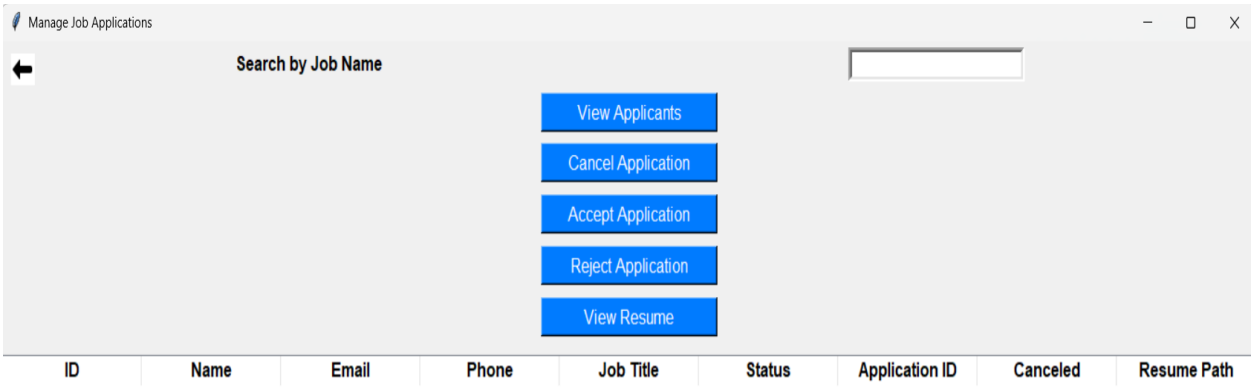

Figure 7.14: Manage Candidates

This is the page where Employer can manage candidate and track their application.

Chapter 8

Conclusion

The project has proven to be a meaningful and educative experience. Through this project, we gained valuable insights into the design and development of real-world desktop applications. It helped in understanding the complete development process—from planning and database design to frontend development, backend programming, and system testing.

The project was successfully developed using Python's Tkinter library for the graphical user interface and MySQL for backend data management. The system provided a simple and interactive desktop-based solution where users could register, log in, and perform role-based operations as either job seekers or employers.

Through Tkinter, we were able to design intuitive forms and menus for tasks such as job posting, job browsing, application submission, and profile management. The use of MySQL enabled efficient storage and retrieval of user data, job listings, and application records, ensuring data consistency and integrity.

This project provided practical exposure to integrating GUI programming with database connectivity using Python. It also strengthened understanding of core concepts like event handling, form validation, query execution, and session-like behavior in desktop applications. The system was tested successfully with sample data and worked reliably across different use cases.

Overall, the project objectives were met effectively, and the final application serves as a robust foundation for a job portal system. It can be further enhanced by adding features such as resume upload, application status tracking, admin access, and data export options. The experience gained through this project will be valuable for future work in desktop-based application development and database integration.

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