MINI PROJECT REPORT
ON

"CREATE AUTOMATED JOB APPLICATION USING LINKEDIN"

SUBMITTED IN PARTIAL FULLFILLMENT OF THE REQUIREMENTS OF

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Certificate

This is to certify that the Mini Project-2A entitled "**Create Automated Job Application using LinkedIn"** is a bonafide work of **Smitesh Gajakosh, Prajwal Halle, Sarthak Hasbe and Prathmesh Chaudhari** submitted to the University of Mumbai in partial fulfilment of the requirement for the award of the degree of **"Undergraduate"** in **"Computer Engineering".**

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This project report entitled "CREATE AUTOMATED JOB APPLICATION USING LINKEDIN" submitted by **"Smitesh Gajakosh, Prajwal Halle, Sarthak Hasbe, Prathmesh Chaudhari"** is approved for the degree of Bachelor of Engineering in Computer Engineering.

Examiners

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Date:

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Declaration

We declare that this written submission represents our ideas in our own words and where others ideas or words have been included. We have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will because for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Abstract

In today's competitive job market, enhancing the application process is crucial for both job seekers and recruiters. This project explores an automated job application system integrated with LinkedIn, utilizing advanced algorithms to enhance the job search process. By leveraging Python's flexibility and LinkedIn's extensive network, the system offers a scalable and customizable solution to improve application management. This innovative approach aims to improve efficiency and effectiveness in the job search journey, ultimately empowering users to navigate the job market with greater ease.

Keywords: Automated Job Application, Job Matching, Application Submission, Keywords Extraction, Job Board Integration, Career Development

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Chapter 1

Introduction

1.1 Background

In today’s competitive job market, job seekers encounter significant challenges in the application process. Traditional methods often rely on manual searches and tailored applications, making it difficult for candidates to stand out. The volume of available positions can be overwhelming, and many qualified individuals are overlooked due to the complexities of applicant tracking systems. This inefficiency not only frustrates job seekers but also complicates the hiring process for employers. Consequently, there is an urgent need for innovative solutions that streamline job searches and applications. The "Create Automated Job Application" project aims to enhance efficiency and user experience, leveraging technology to improve candidate matching and facilitate a more effective, equitable employment landscape.

1.2 Motivation

The inefficiencies and complexities of traditional job application processes have spurred the need for innovative solutions that leverage modern technology. The rise of automation and data-driven approaches presents a significant opportunity to transform how job seekers navigate the employment landscape. By integrating Natural Language Processing (NLP) and machine learning algorithms, our project aims to streamline the job search and application process, facilitating real-time matching between candidates' qualifications and available positions. As competition in the job market intensifies, the demand for efficient, user-friendly tools has never been greater. Our initiative is driven by a commitment to enhance the job-seeking experience, increase opportunities for candidates, and support employers in finding the right talent. Through this project, we aspire to create a more efficient, equitable, and accessible employment ecosystem for all.

Chapter 2

Literature Survey

2.1 Basic Terminologies

1. **Keyword Extraction:** Identifying and extracting relevant keywords from a user's resume to match with job postings.
2. **Job Matching Algorithm:** A computational method used to compare extracted keywords from resumes with job descriptions to identify suitable job opportunities.
3. **Automated Application Submission:** It enables the system to send resumes directly to employers for matching job postings without manual intervention.
4. **Job Board Integration:** Incorporation of APIs from various job platforms (like LinkedIn, Indeed) to fetch real-time job listings for analysis and matching.
5. **Real-time Job Alerts:** Instant notifications sent to users about new job opportunities that match their qualifications and preferences.
6. **Application Tracking:** Feature that allows users to monitor the status of their submitted applications and receive updates.
7. **User Profile:** A personalized account created by the job seeker that stores their resume, qualifications, and preferences for job applications.
8. **User Dashboard:** A graphical interface that allows users to view matched job listings, application statuses, and manage their profiles.
9. **Data Privacy Compliance:** Adherence to regulations and standards that protect users' personal information and ensure secure handling of data during the application process.

2.2 Existing system

The current job application process predominantly relies on traditional methods that require significant manual effort from job seekers. Candidates typically search for job openings on various platforms, meticulously tailoring their resumes and cover letters for each application. However, this system presents numerous challenges, including the time-consuming nature of job searches, difficulty in finding suitable positions, and the potential for qualified candidates to be overlooked due to generic application processes. Many job seekers struggle with applicant tracking systems (ATS) that prioritize specific keywords, often resulting in automated rejections of otherwise strong applications. Additionally, the lack of real-time feedback on application status and the absence of centralized tools for tracking submissions contribute to frustration and inefficiency. Overall, the existing job application system is marked by inefficiency, inequality in access to opportunities, and a need for technological advancements that can streamline and enhance the job search experience for all candidates.

2.3 Problem statement

The current job application process is characterized by inefficiencies that hinder job seekers in finding suitable employment. Traditional methods rely heavily on manual searches and tailored applications, leading to time-consuming and overwhelming experiences. Many qualified candidates are overlooked due to applicant tracking systems (ATS) that filter based on specific keywords. Additionally, the lack of real-time feedback on application status creates uncertainty, contributing to frustration and disengagement. These challenges not only waste valuable time but also perpetuate inequities in access to job opportunities, ultimately affecting individuals' career advancement and economic stability in a competitive job market.

2.4 Literature Survey

According to our Project “Create Automated Job Application”, we studied various papers related to Automatic application for seeking job. The main 4 papers are as follows:

- Create an Automated Job Application by Using LinkedIn published in International Journal Of Innovative Research In Computer And Communication Engineering, Volume 12, Issue 5, May 2024, e-ISSN: 2320-9801

- A Research Paper on Online Job Portal System publishedin International Journal of New Innovation in Engineering and Technology, Volume 24, Issue 1, in March 2024, ISSN: 2319-6319l

- Assessing the Effectiveness of LinkedIn as a Job Search and Career Development Platform for Students publishedin International Journal of Novel Research and Development, Volume 8, Issue 9 in September 2023, ISSN: 2456-4184

- Automated Resume Screening Using Natural Language Processing published in Journal of Emerging Technologies and Innovative Research, Volume 10, Issue 3, in March 2023, ISSN: 2349-5162

Sr No	Name of Paper	Name of Authors	Advantages	Limitations
1.	Create an Automated Job Application by Using LinkedIn published in International Journal of Innovative Research in Computer And Communication Engineering, Volume 12, Issue 5, May 2024 e-ISSN: 2320-9801	Pratik Dhandre, Neehal Jiwane, L. N. Yadav	1. Provide Productive work application strategy 2. Leverages the LinkedIn API and Python programming dialect	1. Lacks AI integration 2. Mobile App development
2.	A Research Paper on Online Job Portal System published in International Journal of New Innovation in Engineering and Technology, Volume 24, Issue 1, in March 2024 ISSN: 2319-6319l	Arunthathi S, Logeshwari T, Anuratha V	1. Leverages social media data to enhance job matching 2. Project is planned for both job seekers and company	1. Limited to certain social platforms 2. Job detection accuracy
3.	Assessing the Effectiveness of LinkedIn as a Job Search and Career Development Platform for Students publishedin International Journal of Novel Research and Development, Volume 8, Issue 9 in September 2023 ISSN: 2456-4184	Aishu R	1. Rank candidate effectively 2. Less complex System design	1. Privacy concerns 2. Sends notification through e-mail
4.	Automated Resume Screening Using Natural Language Processing published in Journal of Emerging Technologies and Innovative Research, Volume 10, Issue 3, in March 2023 ISSN: 2349-5162	Dr. D Lakshmi Padmaja, Vishnuvardhan, Rajeev, Nitish Kumar	1. Improved Precision and Effectiveness 2. More accurate candidate matching	1. Limited Resume Templates 2. Lacks complex evaluation for Job Search

Table 2.1 : Literature Survey

1. Create an Automated Job Application by Using LinkedIn

In today's competitive job market, delivering quality work is essential for both job seekers and employers. This project combines Python programming with LinkedIn's capabilities to streamline the application process. It aims to develop an engine that downloads job listings from LinkedIn and submits applications on behalf of users through web scraping and automation. The system will utilize LinkedIn's API to retrieve job titles, companies, and descriptions, automatically filling out applications with user-provided information. It also features application tracking, response management, and follow-up capabilities, offering a scalable and customizable solution to enhance job search efficiency.

2. A Research Paper on Online Job Portal System

The incorporation of "Online Job Portal System" aims to automate manual processes through user-friendly software and equipment, enhancing data storage and retrieval efficiency. It focuses on meeting user needs while facilitating the long-term storage of essential information. By providing easy-to-use tools, the system enables effective management and allows users to concentrate on their tasks, optimizing resource utilization. Streamlined record-keeping reduces duplicate entries, ensuring quick access to relevant information and minimizing distractions. Ultimately, the system seeks to enhance client services and organizational performance while simplifying management tasks.

3. Assessing the Effectiveness of LinkedIn as a Job Search and Career Development Platform for Students

The system reviews LinkedIn as a vital tool for recruiters and job seekers, highlighting its evolution from a networking platform to a content-sharing hub. Through a literature review and a quantitative online survey among graduates and postgraduates, the study examines personal branding and job opportunities on LinkedIn. Findings indicate satisfaction with job search features, relevance of recommendations, and the importance of networking. The analysis identifies significant predictors of job-hunting success, underscoring the effectiveness of leveraging LinkedIn for job opportunities and overall user satisfaction with the platform's features.

4. Automated Resume Screening Using Natural Language Processing

The most qualified applicant for a position must be found through careful consideration of job applications, which is done during the Automated Evaluation of Resumes Using NLP stage of the hiring process. Automated resume screening is now a practical alternative to the manual screening procedure because to developments in deep learning and natural language processing (NLP). To increase the precision and effectiveness of the screening process, these approaches employ a variety of methods including hybrid deep learning frameworks, transfer learning, genetic algorithms, and multisource data.

5. Assessing the Effectiveness of LinkedIn as a Job Search and Career Development Platform for Students

In today's competitive job market, delivering quality work is essential for both job seekers and employers. This project combines Python programming with LinkedIn's capabilities to streamline the application process. It aims to develop an engine that downloads job listings from LinkedIn and submits applications on behalf of users through web scraping and automation. The system will utilize LinkedIn's API to retrieve job titles, companies, and descriptions, automatically filling out applications with user-provided information. It also features application tracking, response management, and follow-up capabilities, offering a scalable and customizable solution to enhance job search efficiency.

6. Create an Automated Job Application by Using LinkedIn

In today's competitive job market, delivering quality work is essential for both job seekers and employers. This project combines Python programming with LinkedIn's capabilities to streamline the application process. It aims to develop an engine that downloads job listings from LinkedIn and submits applications on behalf of users through web scraping and automation. The system will utilize LinkedIn's API to retrieve job titles, companies, and descriptions, automatically filling out applications with user-provided information. It also features application tracking, response management, and follow-up capabilities, offering a scalable and customizable solution to enhance job search efficiency.

7. Create an Automated Job Application by Using LinkedIn

In today's competitive job market, delivering quality work is essential for both job seekers and employers. This project combines Python programming with LinkedIn's capabilities to streamline the application process. It aims to develop an engine that downloads job listings from LinkedIn and submits applications on behalf of users through web scraping and automation. The system will utilize LinkedIn's API to retrieve job titles, companies, and descriptions, automatically filling out applications with user-provided information. It also features application tracking, response management, and follow-up capabilities, offering a scalable and customizable solution to enhance job search efficiency.

8. Create an Automated Job Application by Using LinkedIn

In today's competitive job market, delivering quality work is essential for both job seekers and employers. This project combines Python programming with LinkedIn's capabilities to streamline the application process. It aims to develop an engine that downloads job listings from LinkedIn and submits applications on behalf of users through web scraping and automation. The system will utilize LinkedIn's API to retrieve job titles, companies, and descriptions, automatically filling out applications with user-provided information. It also features application tracking, response management, and follow-up capabilities, offering a scalable and customizable solution to enhance job search efficiency.

Chapter 3

Requirement Gathering

3.1 Software and Hardware Requirements

Here we will discuss everything we will need in order to execute. Below we list the necessary software requirements.

1. Software Requirements:

- Python 3.x
- Selenium WebDriver
- BeautifulSoup
- Pandas
- PyAutoGUI
- YAML

2. Hardware Requirements:

- 8 GB RAM
- 512 GB SSD

Chapter 4

Plan of Project

4.1 System Architecture

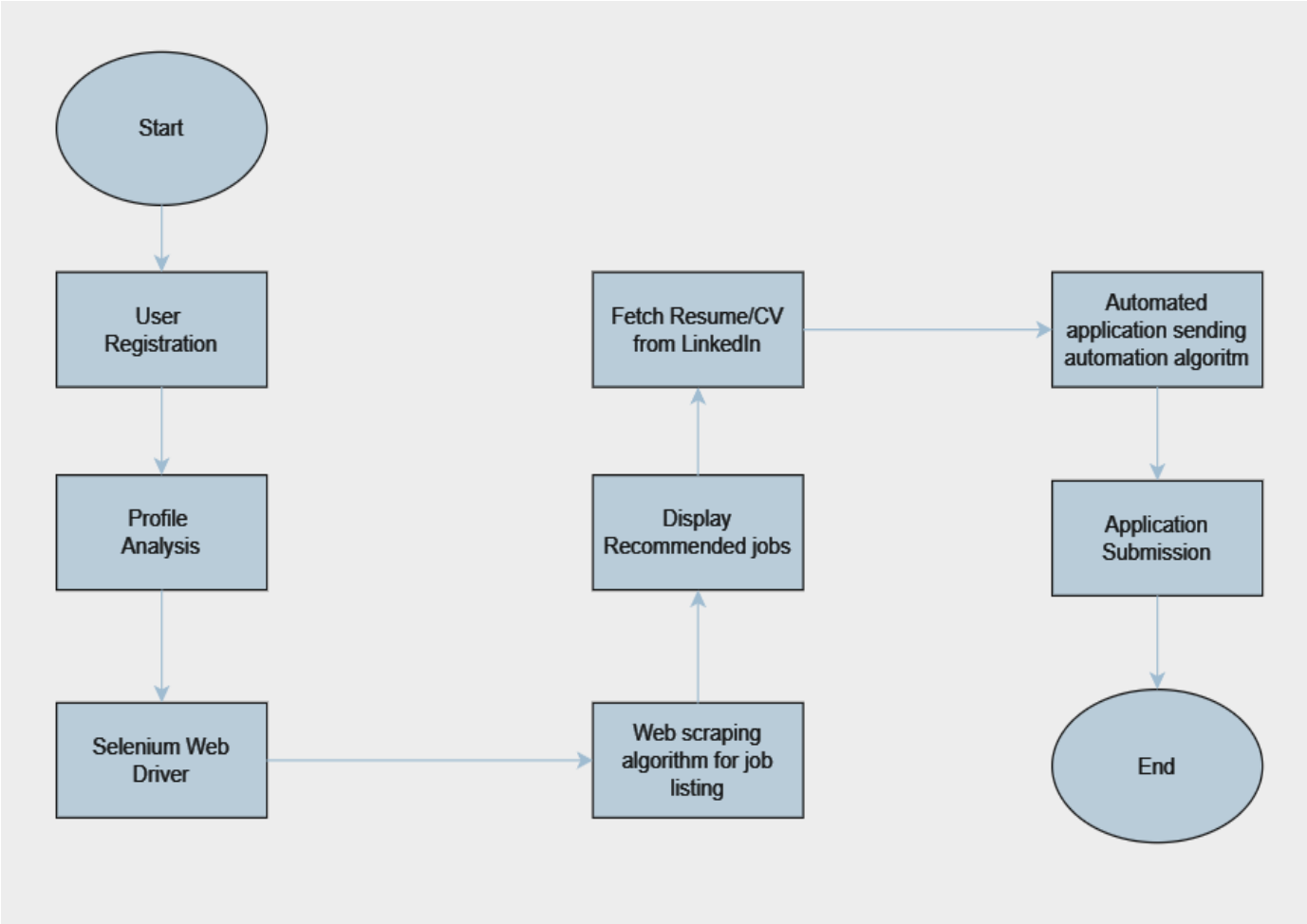

Figure 4.1: System Architecture

4.2 Methodology

The methodology for developing the “Automated Job Application using LinkedIn” project involves thefollowing steps:

1. **Requirement Analysis:** Analyze functional and non-functional requirements for Automated Job Application, considering user profile creation, job matching algorithms, resume submission processes, system performance, user privacy, and data security.

2. **API and Tool Selection:** Choose suitable job-seeking APIs (e.g., LinkedIn, Indeed) based on data richness, reliability, and integration capabilities.

3. **System Architecture Design**: Design a scalable and modular architecture that includes components for user input, job data retrieval, keyword matching, and application submission.

4. **User Input Integration:** Develop forms for users to enter their personal details, qualifications, and skills. Ensure that the input is user-friendly and accessible.

5. **Job Data Retrieval Implementation:** Integrate to fetch job listings, ensuring that data retrieval mechanisms are efficient and robust.

6. **Keyword Matching Algorithm Development:** Implement a keyword matching algorithm using NLP techniques to compare user profiles against job descriptions. Optimize for accuracy and relevance.

7. **Application Submission Mechanism:** An automated submission process for applying to matched job listings. Ensure compliance with the terms of service of LinkedIn.

8. **User Interface Design:** Design a user-friendly interface that provides visual feedback on job matches in CLI, and allows users to track their submissions easily.

9. **Testing and Validation:** Conduct thorough testing to validate the system's functionality, including the accuracy of job matching and the reliability of resume submissions. Test under various scenarios to ensure robustness.

10. **Deployment and Evaluation:** Deploy the automated job application system in a real-world environment, collecting feedback from users to assess its effectiveness. Evaluate user experience and matching accuracy, iteratively refining the system based on user input and performance metrics for continuous improvement.

Flowchart of System

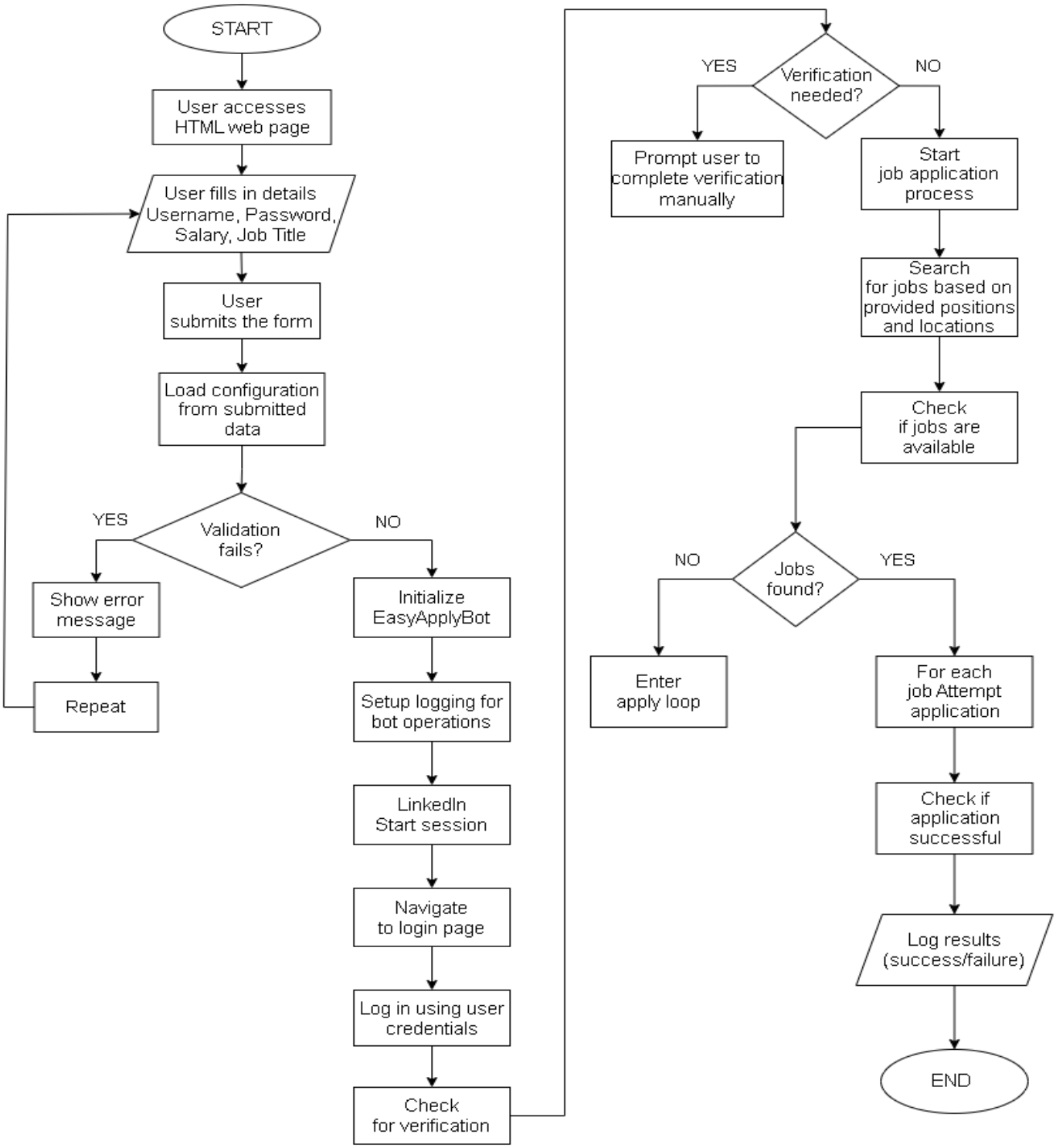

Figure 4.2.1: Flowchart of System

Use Case Diagram

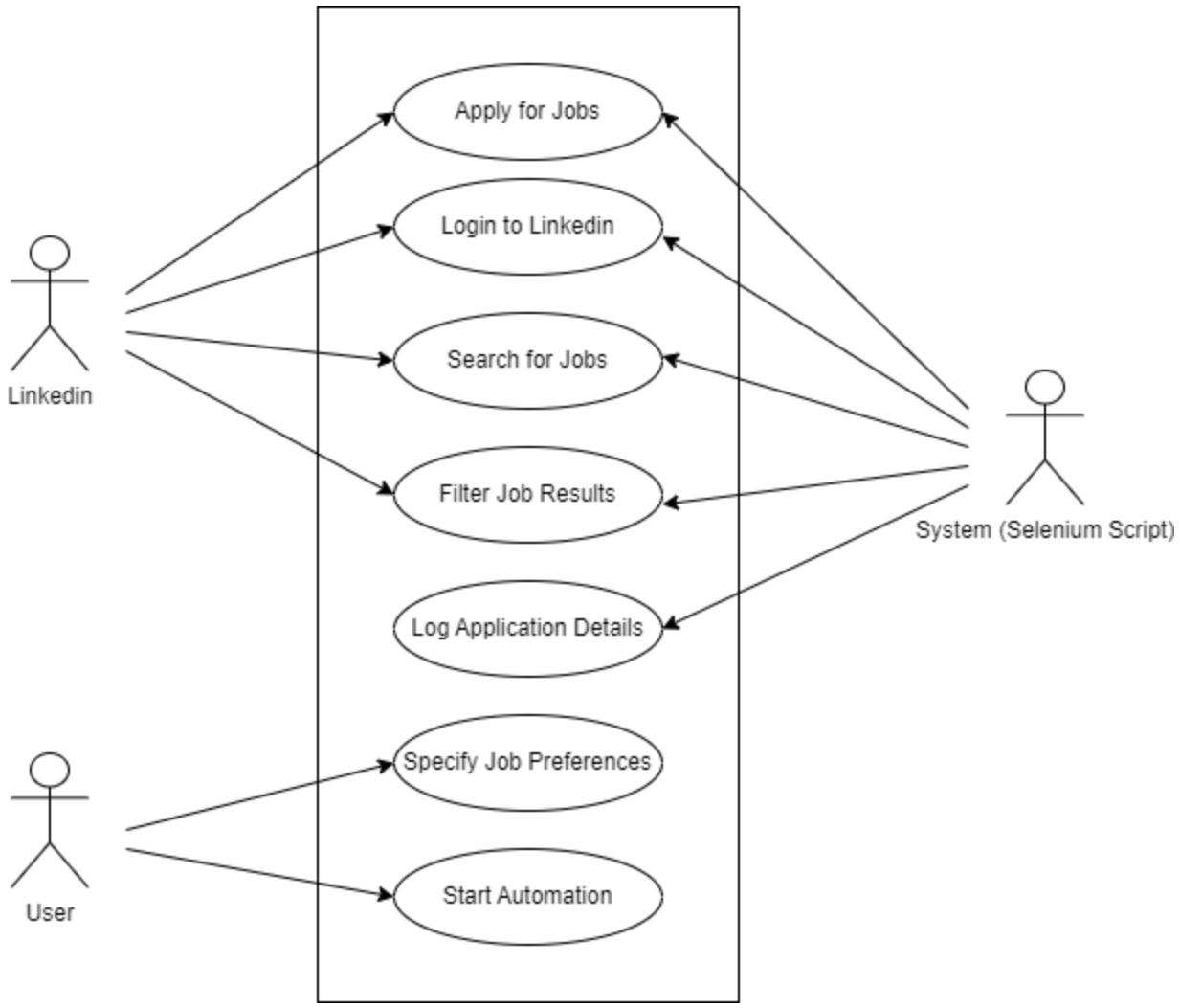

Figure 4.2.2: Use Case Diagram

User Lane: The user initiates the process by specifying job preferences and starting the automation.

System Lane: The Python Selenium Automation handles tasks like launching the browser, logging into LinkedIn, navigating to the Jobs section, and applying for jobs. It also logs applied jobs if necessary.

LinkedIn Lane: LinkedIn displays the corresponding pages such as the login page, job search results, job application form, and the confirmation after submitting the job application.

Sequence Diagram

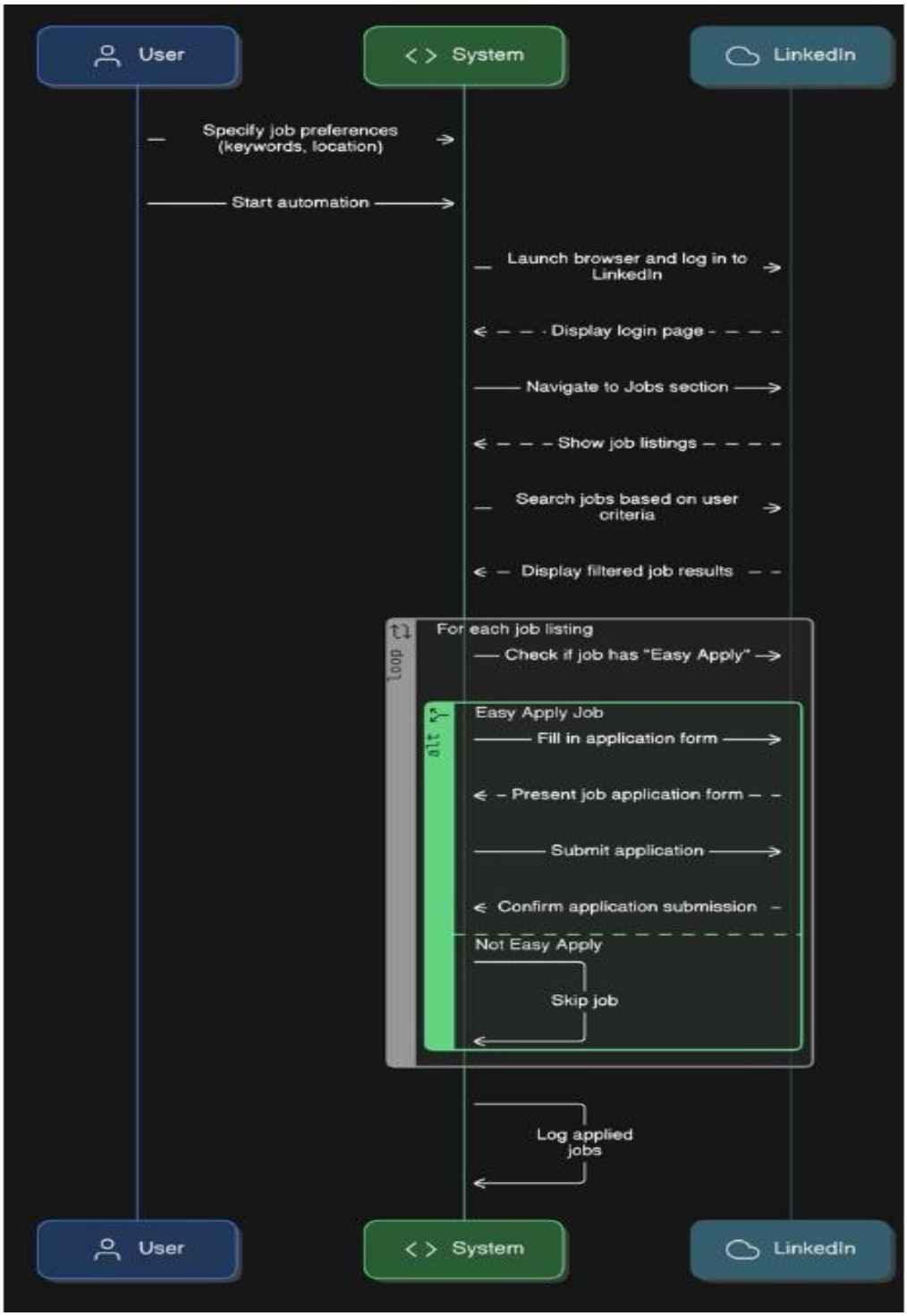

Figure 4.2.3: Sequence Diagram

Chapter 5

Result Analysis

5.1 Results

User Login Page:

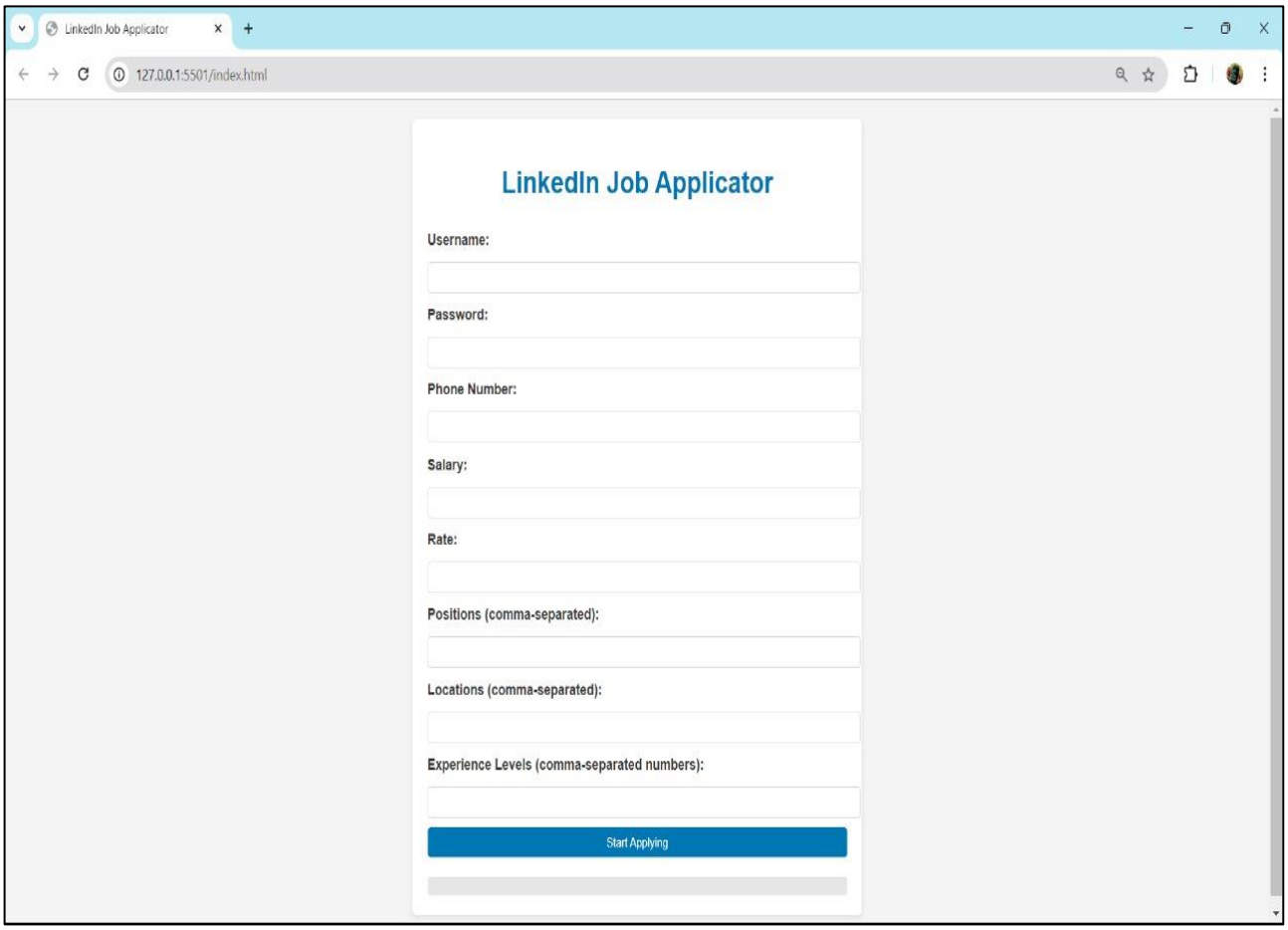

Figure 5.1.1: User Login Page

The image demonstrates the User Login page that includes fields like Username, Password, Phone Number, Salary expected, Location preferred and Experience level of user through which he can apply for jobs.

Automatic User Login to LinkedIn Account:

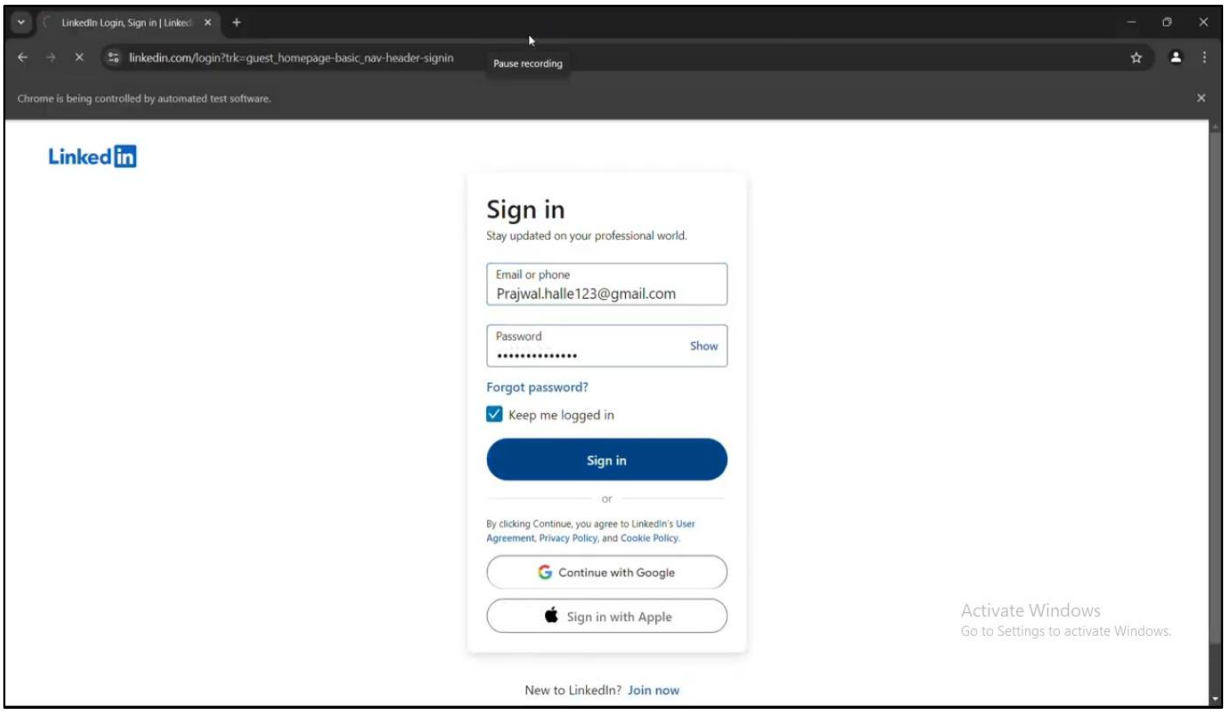

Figure 5.1.2: Automatic User Login to LinkedIn Account

The image showcases the automated login process, the bot uses Selenium WebDriver, which simulates a real browser interaction. This allows the bot to mimic user behavior, such as clicking on buttons and filling out forms, to successfully log in to the LinkedIn account.

Live Applying for Jobs:

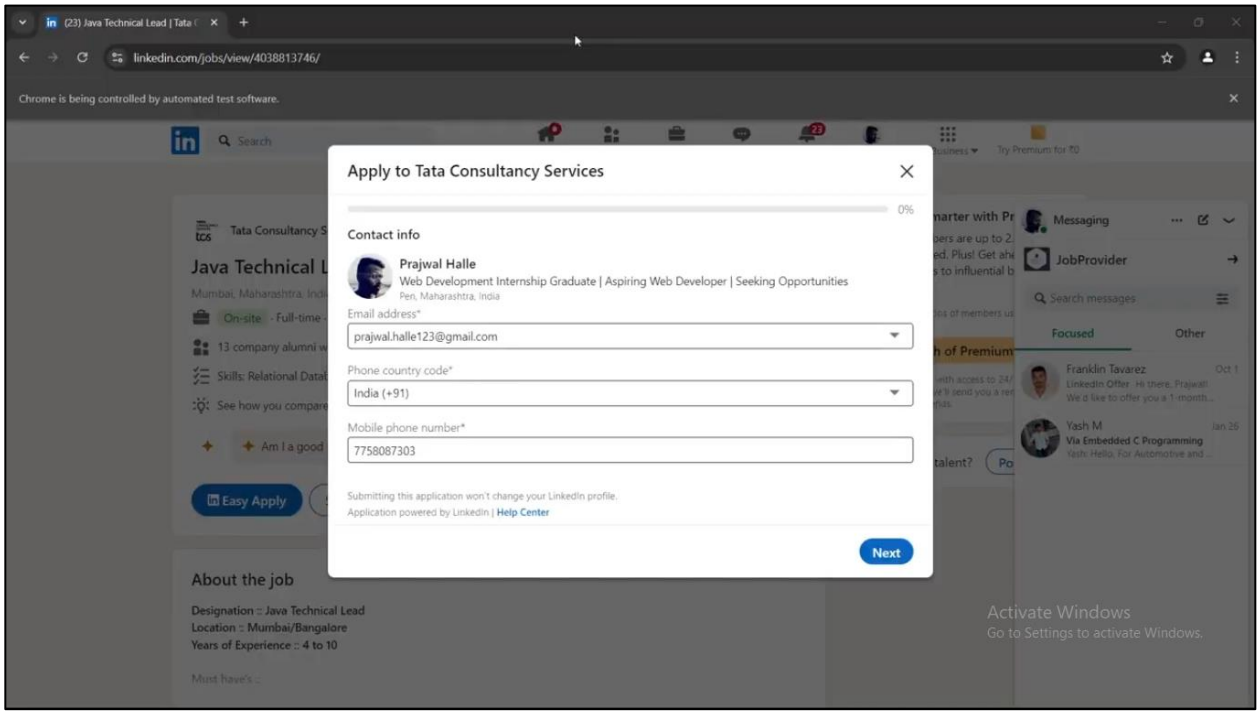

Figure 5.1.3: Result of Live Applying for Jobs

The image demonstrates real-time matching of job profiles, the bot uses keyword extraction techniques, such as TF-IDF (Term Frequency-Inverse Document Frequency), to identify the most important keywords in the job description. These keywords are then compared to the user's skills and preferences to determine the relevance of the job.

Live Application Sent to Companies:

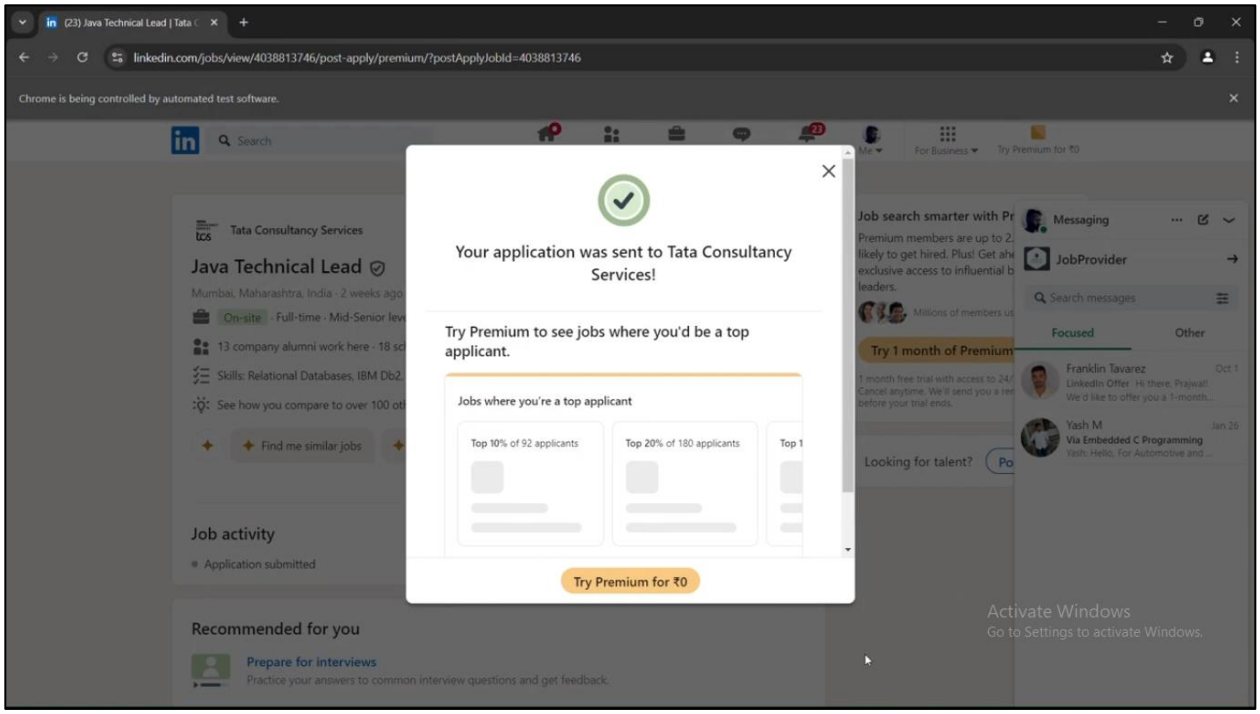

Figure 5.1.4: Result of Live Application sent for Jobs

The image demonstrates real-time submission of the application, the bot uses web automation techniques, such as Selenium WebDriver, to simulate user interactions on the company's website or job portal. This allows the bot to navigate to the job posting, fill out the application form, and upload the resume. job.

Chapter 6

Conclusion

Conclusion

The development of an Automated Job Application system represents a transformative step in the job-seeking process, providing users with an efficient and streamlined way to connect with suitable employment opportunities. By leveraging advanced keyword matching algorithms and job-seeking APIs, this system eliminates the tedious task of manual applications, significantly increasing the chances of matching candidates with relevant positions. This innovative approach not only empowers job seekers by automating submissions but also enhances their chances of success in a competitive job market. Ultimately, the system aims to simplify the application process, saving time for both candidates and employers while fostering a more effective and responsive job search experience.

Chapter 7

References

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