Career Predictor

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Abstract. In today's highly competitive landscape with a multitude of technologies and job opportunities, it's crucial to understand your own capabilities in order to pursue your desired job and secure a competitive salary. To aid in this endeavor, we've created a web application designed to assess your strengths, identify suitable career options, and estimate the salary you can command based on your skills and talents. In the current fiercely competitive job market, characterized by a myriad of technological advancements and abundant career prospects, it becomes increasingly essential to have a deep understanding of your own skill set to pursue your dream job and secure a competitive income. To facilitate this endeavor, we've developed a web-based tool tailored for assessing your strengths, pinpointing suitable career paths, and estimating your earning potential based on your unique abilities. Furthermore, for employers seeking the perfect fit for a position or role, this application simplifies the candidate selection process by identifying the most qualified individuals.

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1 Introduction

An introduction provides you with a quick overview of the project's purpose.

1.1 Purpose

The purpose of our project is to develop a system that analyzes resumes using natural language processing and machine learning techniques to provide individuals with valuable insights into their potential career paths and opportunities based on their skills, qualifications, and experiences.

1.2 Scope

The goal of the project is to create software that can parse and analyze resumes to gather pertinent data regarding a candidate's experience and education. This system will help people make well-informed decisions about their career paths by using machine learning and natural language processing to deliver career-related insights and recommendations. The project's main goal is to parse different resume formats and provide tailored career advice using the information that is collected. The system will work as a tool for career exploration and advising but will not include job matching or application functionalities.

1.3 Overview

The complete overview of our project is our application can help the new job seekers get some information and clarity on their career. Based on the resume they upload and some few questions they answer in the application they will be provided with the suitable jobs title and predict salary for the user or candidate based on the job title predicted it will be very helpful for new graduated students to kick-start their career in this competitive world. So that they can be confident and apply for the job they prefer and enjoy working job. Well coming to company side there are lot of applicant's Applying for one job. Our application helps the companies to pick the right candidate for the job roll and saves a lot of time and effort by picking the right candidate for the job from lot of applications based on their skills.

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2 General Description

2.1 Product Perspective

This application helps candidates to improve their careers by giving personalized advice and tools based on their resume and by answering behavioural questions. Then they will get clarification on their career. It also makes easier for organizations to find the right candidates by matching their needs with job seekers.

2.2 Product Functions

This application has 2 parts namely candidate and employer. Those 2 are reponsible for entire apllication to work

1. Candidate
   - Career Seeker needs to sign up for Career Predictor.
   - The career seeker should select any of the services offered by career predictor
   - The career seeker should have a resume and be able to respond to some behavioral questions
   - The Career Prediction is available that benefits career
2. Employer
   - HR needs to sign up for Career Predictor.
   - The career seeker should select any of the services offered by career predictor
   - Next, HR should decide which personality is best suited for the job and which position
   - HR can filter the resumes and then finalize the ideal match candidate next

3 Specific Requirements

3.1 External Interface Requirements

User Interfaces: The webapplication will have a Navigation bar for viewing Employee and Employer pages. In the Employee we can view personality prediction, job prediction and the salary prediction. In the Employer we can view

Hardware Interfaces: This webapplication should function seamlessly on any device equipped with a compatible web browser.

Software Interfaces: Visual Studio Code Mongodb

3.2 Functional Requirements

We have used Python and Machine Learning on the backend so need to install and connect python to the Visual Studio Code. We have used the version python 3.7.9. Functional requirements refer to particularly important system requirements in a software engineering process (or at micro level, a sub part of requirement engineering) such as technical specifications, system design parameters and guidelines, data manipulation, data processing and calculation modules etc. Functional requirements may involve calculations, technical details, data manipulation and processing, and other specific functionality that define what a system is supposed to accomplish. Behavioural requirements describe all the cases where the system uses the functional requirements, these are captured in use cases. Functional Requirements contrast with other software design requirements referred to as Non-Functional Requirements which are primarily based on parameters of system performance, software quality attributes, reliability and security, cost, constraints in design/implementation etc. The key goal of determining "functional requirements" in a software product design and implementation is to capture the required behaviour of a software system in terms of functionality and the technology implementation of the business processes. The Functional Requirement document (also called Functional Specifications or Functional Requirement Specifications) defines the capabilities and functions that a System must be able to perform successfully.

Required Python packages:

- pandas
- pickle
- tkinter
- pymongo
- pyresparser
- resume_parser
- sklearn
- flask
- spacy
- numpy
- seaborn
- xgboost

Home page: This page should display two fields Employee and Employer.

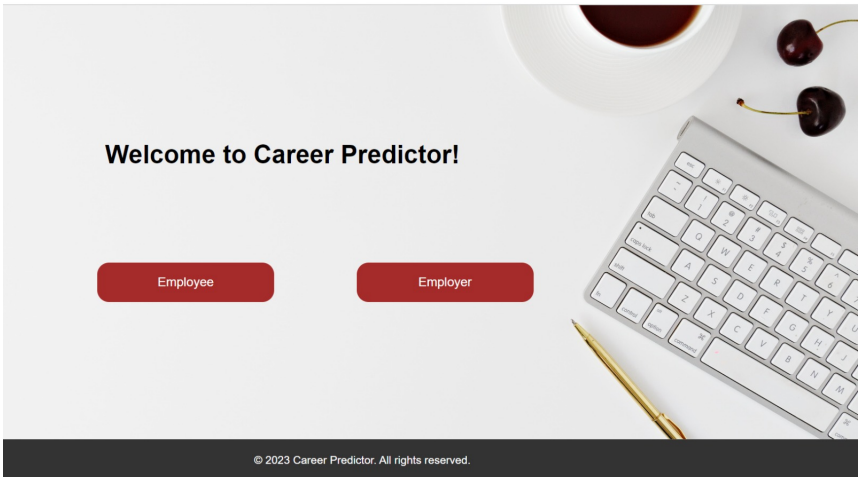


Fig. 1. Home page

Registration Page for Employee: Users without a Username and Password must register on this page. This page consists of email address, password, and re-enter password.

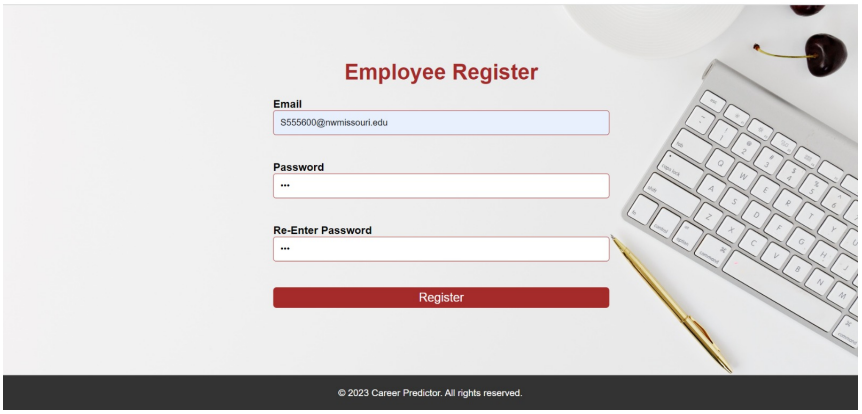


Fig. 2. Registration Page for Employee

Login Page for Employee: This page should display two text fields with a Username and password and the login button.

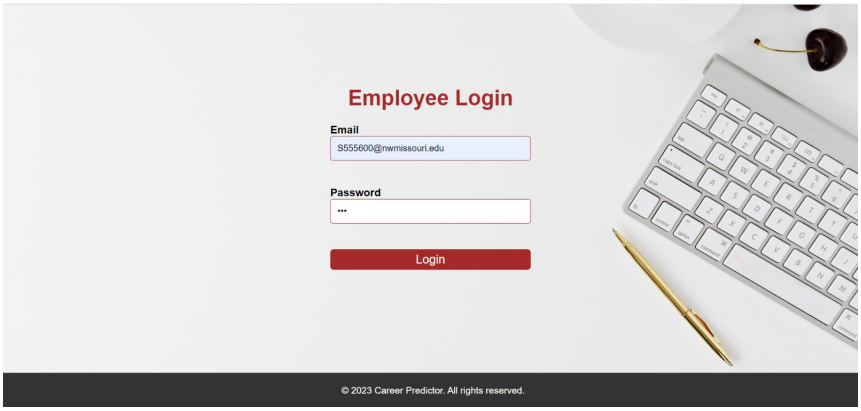


Fig. 3. Login Page for Employee

Dashboard: The dashboard should consist of Personality prediction, Job prediction and Salary prediction.

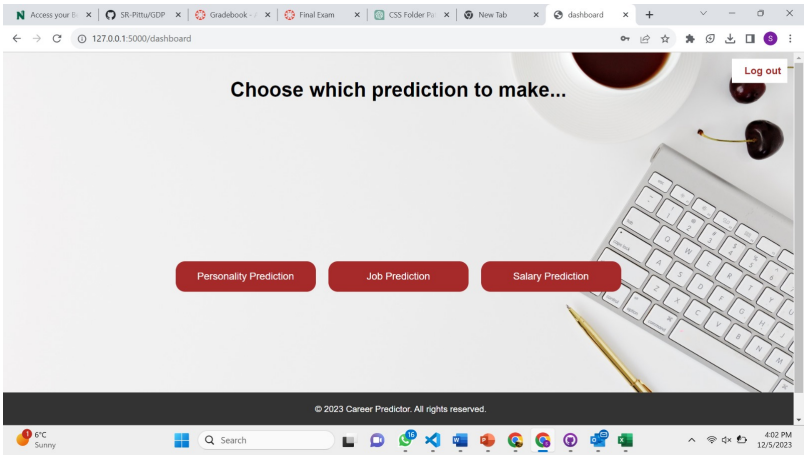


Fig. 4. Dashboard

Personality Prediction Page: In this personality prediction page, all the users who are logged in would be able to predict their personality based on the fields like Name, age, gender, upload resume, and the personality traits like openness, Neuroticism, Conscientiousness, Agreeableness, Extraversion.

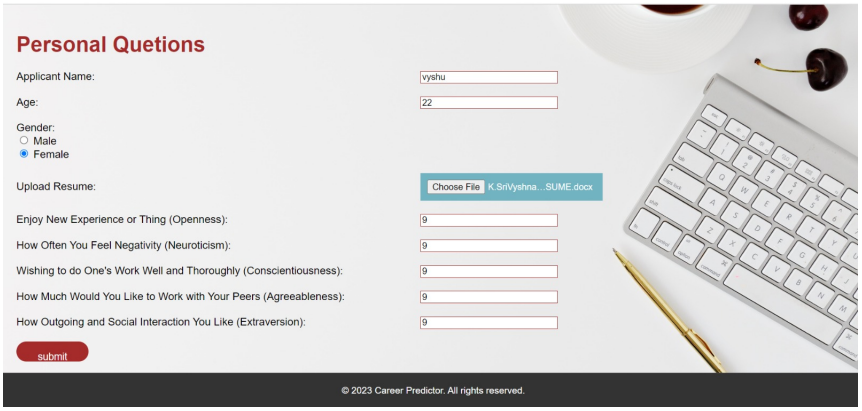


Fig. 5. Personality Prediction Page

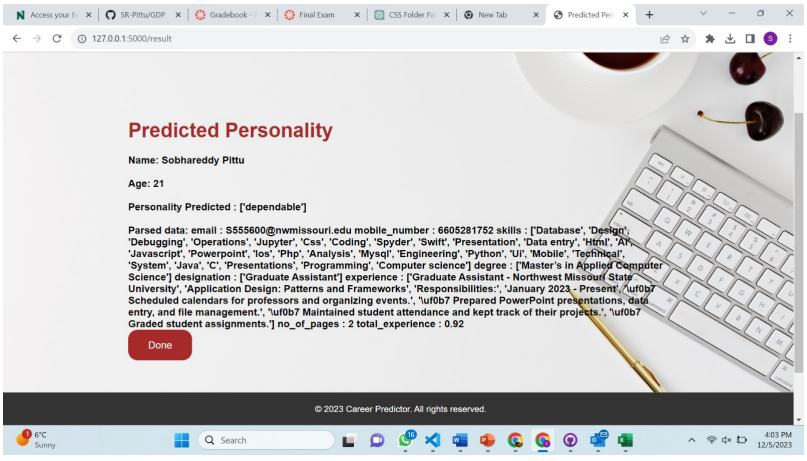


Fig. 6. Personality Prediction output Page

Job Prediction Page: In this page, one would be able to predict their job title by adding their personal information in the given fields like Name, rate your logical quotient skills, rate your coding skills, enter number of Hackathons participated, Rate your public speaking and also few Behavioral questions.

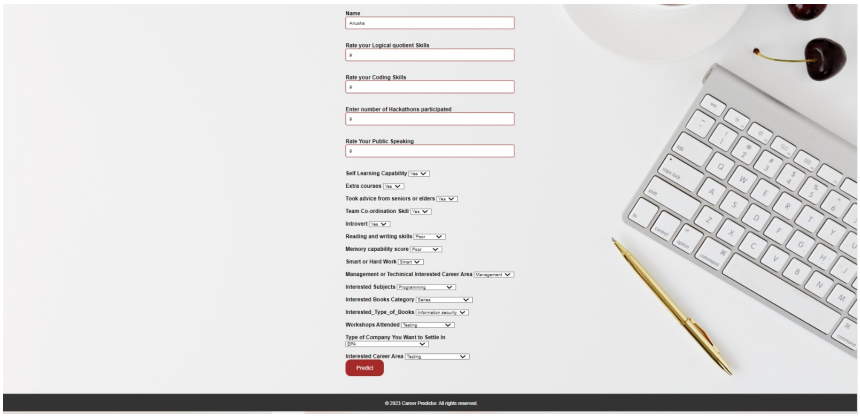


Fig. 7. Job Prediction Page

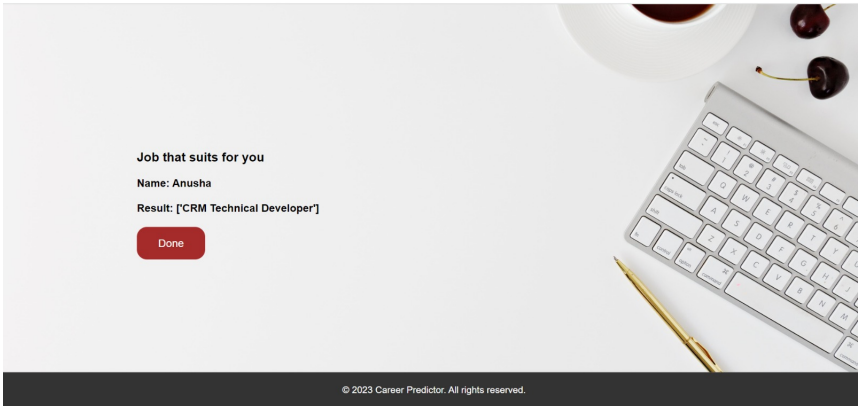


Fig. 8. Job Prediction output page

Salary Prediction Page: In this page, one would be able to predict their salary depending on their job roles and experience by providing their information in the given fields like Name, Country, Education level, years of experience.

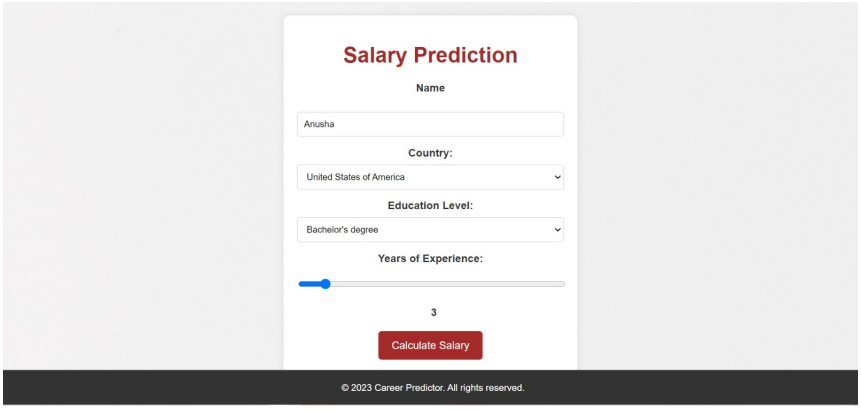


Fig. 9. Salary Prediction Page

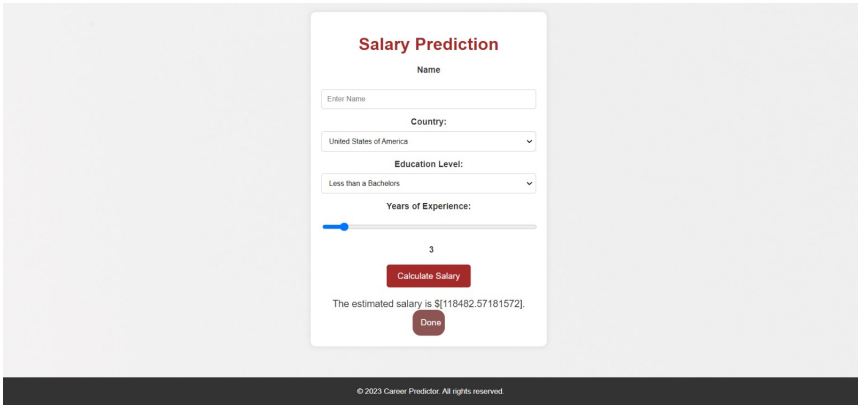


Fig. 10. Salary prediction Output page

Registration Page for Employer: Employers without a Username and Password must register on this page. This page consists of Organization Name, email address, password, and re-enter password.

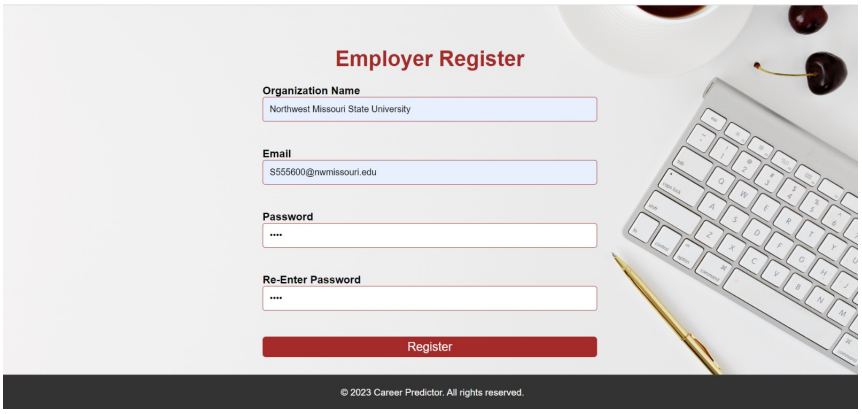


Fig. 11. Registration Page for Employer

Login Page for Employer: This page should display two text fields with an Organization Name, email and password and the login button.

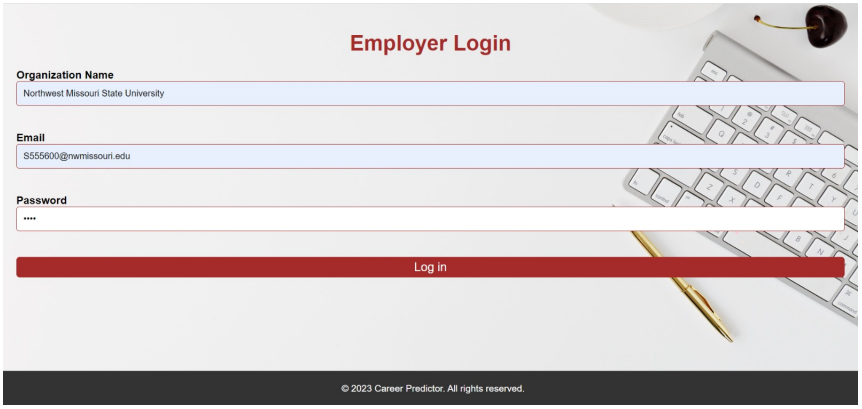


Fig. 12. Login Page for Employer

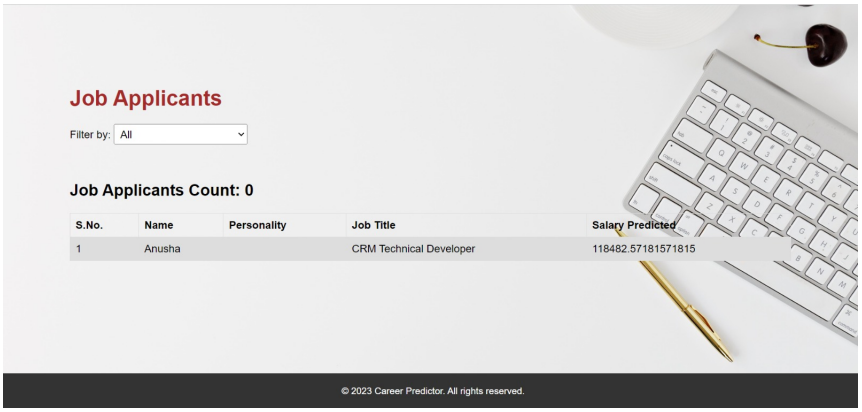
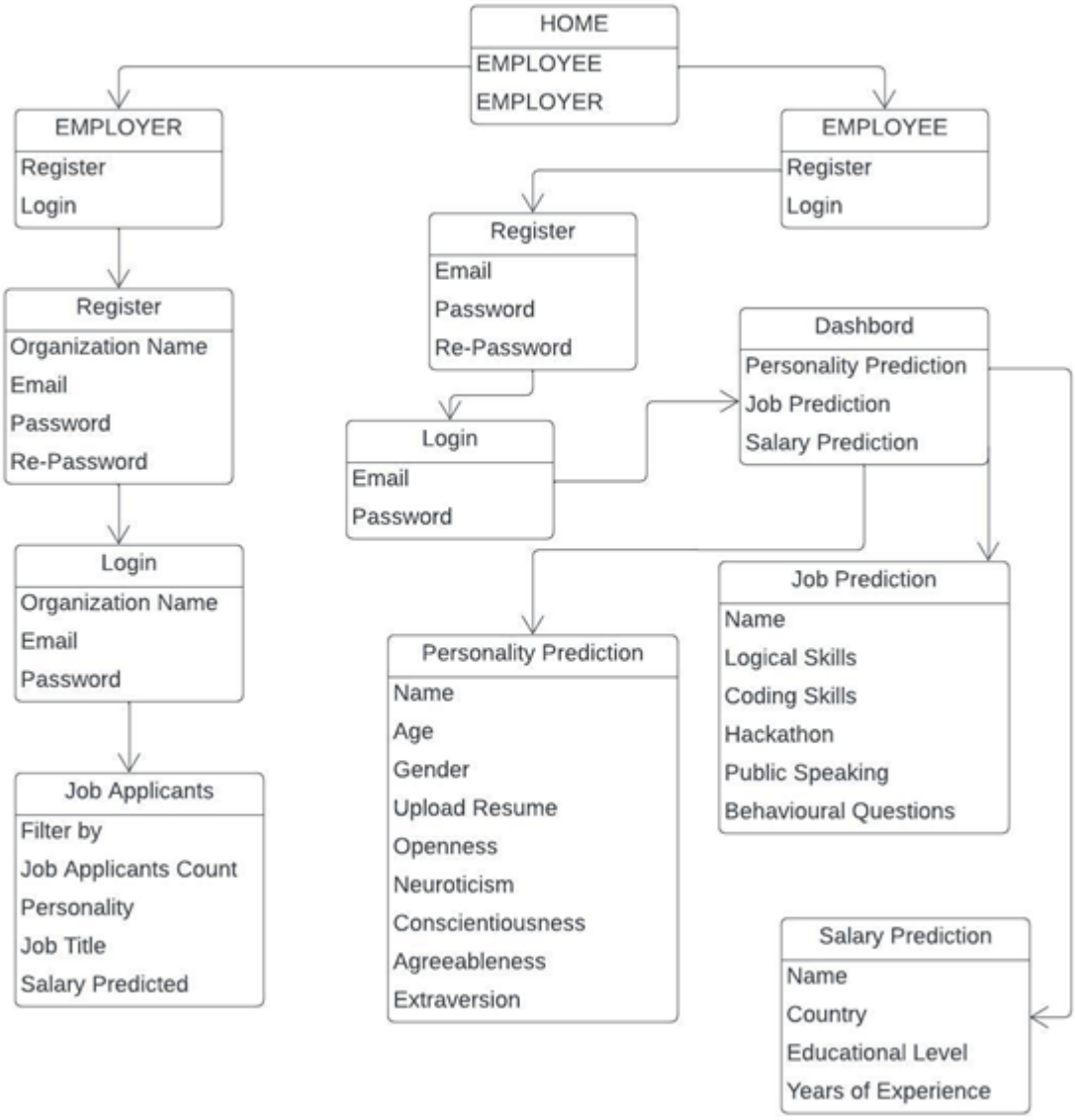


Fig. 13. Employer output page

4 Block Diagram:

In this Block diagram, we have Employee and Employer. Users without a Username and Password must register on this page. This page consists of email address, password, and re-enter password. Once the user registers, they would be able to login to the employee. Once after login they can view the dashboard where the dashboard consists of three fields Personality prediction, job prediction and salary prediction. In the Job prediction user would be able to predict their personality by providing their information in the provided fields and would be able to predict their personality. In the Job prediction users would be able to predict their job title by adding their personal information in the given fields like Name, rate your logical quotient skills, rate your coding skills, enter number of Hackathons participated, Rate your public speaking and few Behavioral questions. In the salary prediction page, users would be able to predict their salary depending on their job roles and experience by providing their information in the given fields like Name, Country, Education level, years of experience. From the Employer view, Employers without a Username and Password must register on this page. This page consists of Organization Name, email address, password, and re-enter password and once the Employers register they need to login to the login page which consists of two text fields with an Organization Name, email and password and the login button and would be able to see the number of persons applied to the jobs depending on their personality traits.


HOME
EMPLOYEE
EMPLOYER
EMPLOYER
Register
Login
EMPLOYEE
Register
Login
Register
Organization Name
Email
Password
Re-Password
Register
Email
Password
Re-Password
Dashbord
Personality Prediction
Job Prediction
Salary Prediction
Login
Email
Password
Login
Organization Name
Email
Password
Job Prediction
Name
Logical Skills
Coding Skills
Hackathon
Public Speaking
Behavioural Questions
Personality Prediction
Name
Age
Gender
Upload Resume
Openness
Neuroticism
Conscientiousness
Agreeableness
Extraversion
Job Applicants
Filter by
Job Applicants Count
Personality
Job Title
Salary Predicted
Salary Prediction
Name
Country
Educational Level
Years of Experience

5 Technical Manual

In this manual we will discuss the overview of the technologies we used and how to do the installation of some tools.

5.1 Document Identification

This document describes the technical aspects of design and implementation of the Career Predictor web application. This document is prepared by the Web Application Team of GDP-02 (44692-04) 2023 fall term.

Product Name: Career Predictor

5.2 System Overview

The Career Predictor platform provides career seekers with a robust array of services, including tailored assessments, resume evaluations, and expert guidance on behavioral interviews. This equips individuals with personalized insights to navigate their career paths effectively, enhancing their job prospects. Simultaneously, the HR module empowers professionals with tools for personality assessments, streamlined position matching, and efficient resume filtering, enabling precise candidate selection and optimizing the hiring process for ideal matches between roles and candidates.

5.3 Product description

Career Predictor aids seekers with assessments and interview prep for better career choices; HR Module facilitates hiring through assessments and resume filters for precise candidate selection.

5.4 Cloud Repository

The website is being built using the GitHub repository. The repository consists of codes, documentation and readme.md. The codes folder consists of the actual codes that are required for the website. These codes have been developed using various to tools. The documentation folder consists of the various documents that help to check the progress of the project. We got some issues while pushing the code into repository from different machines, so we have combined them all into one machine and stored in on repository.

Link to Github Repo: Link

5.5 Planned Objectives

Objectives	Status
Decide the name of the product	Done
Gathering the requirements for the entire product	Done
Build the ER diagram for the entire website	Done
Develop prototypes	Done
Implementation of the frontend part with login/register pages	Done
Implementation of the backend for login/register pages	Done
Connecting to the database	Done
Connect the frontend and backend for login/register pages	Done
Developing machine learning models	Done
Implementation of all pages	Done

Table 1. Planned Objectives

5.6 Tools Used

Tools	**Front-ware**	**Middle-ware**	**Back-ware**	**Database**
HTML	✓			
CSS	✓			
JavaScript		✓		
Machine Learning			✓	
Python			✓	
MongoDB				✓

Table 2. Tools and Technologies

1. **HTML**: HTML5 is used to create web pages and to format text as titles and headings. It defines the structure and layout of a web document by using a variety of tags and attributes.

2. **CSS**: CSS is used for describing the styling of web pages, including colors, layouts, and fonts. It allows one to adapt the presentation to different types of devices, such as large screens, small screens, or printers.

3. **JavaScript**: JavaScript is most used as a client-side scripting language. This means that JavaScript code is written into an HTML page. When a user requests an HTML page with JavaScript in it, the script is sent to the browser

and it's up to the browser to do something with it.

4. **Machine Learning**: Machine learning in the backend leverages data to automate decisions, optimize processes, and enhance system intelligence, enabling predictive analytics and personalized user experiences.

5. **Python**: Python in the backend empowers systems with its simplicity and versatility, enabling scalable, efficient backend operations through its rich libraries and frameworks, facilitating data handling, logic implementation, and seamless integrations.

6. **MongoDB**: MongoDB, a NoSQL database, offers flexible data storage with its document-oriented structure, enabling scalable and agile database management while supporting diverse data types and distributed computing capabilities.

7. **Kaggle**: Kaggle is used as a stand alone in our project. We use data sets from the kaggle to train our machine learning models. The data sets are not directly involved in our project.

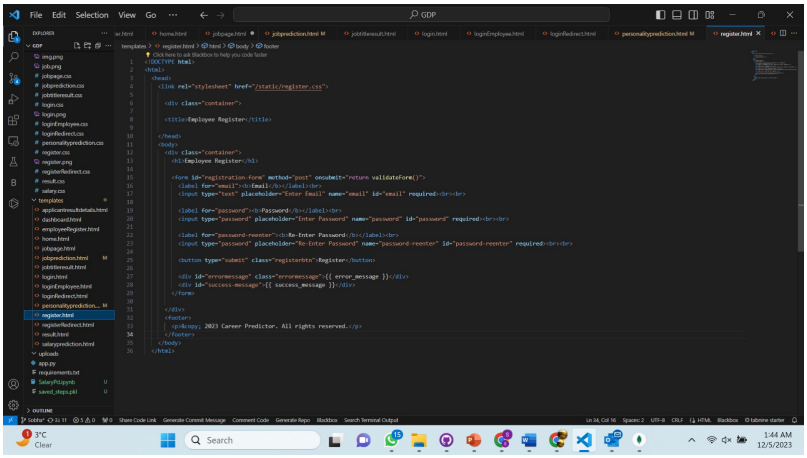
5.7 Develpoment Process

Backend Implementation: We have installed necessary python packages like pandas, pyresparser, resumeparser, flask in visual studio code.

Frontend Implementation: There are several files including .html, .css & .js as their extensions. All these folders have been created and developed by the frontend developers.

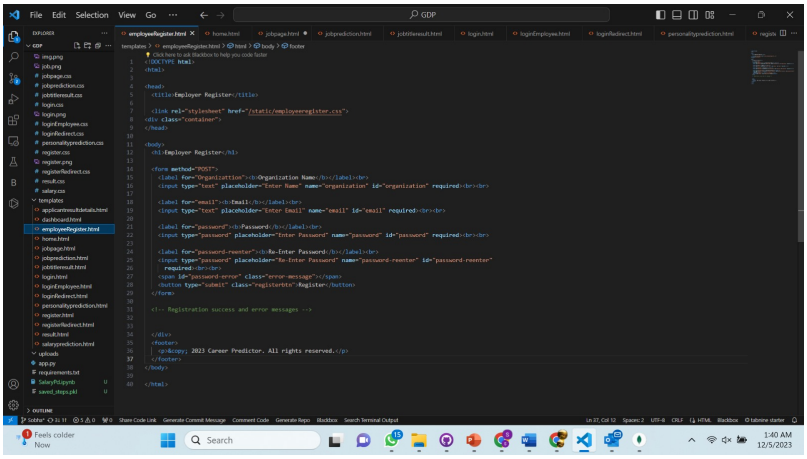
Register's Page:

1. **Employee Page**: This webpage allows employees to register by entering their email and creating a password, with a confirmation field for re-entering the password. The form uses javascript for validation and shows error or success messages accordingly. The page likely has design styles applied from an external CSS file linked in the head section.



HTML link to Employee Register: Link
CSS link to Employee Register: Link

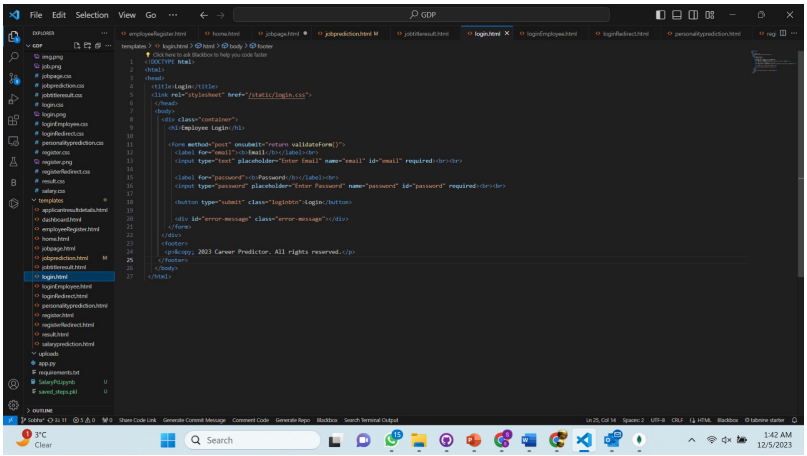
2. **Employer's Page**: This webpage provides an employer to register section by entering the fields consists of the organization's name, email, and password. Users can enter their details and confirm their password to register, utilizing a form submission via the POST method. It might include areas for displaying password validation errors or registration messages, and likely has design styles from an external CSS file.



HTML link to Employer Register: Link
CSS link to Employer Register: Link

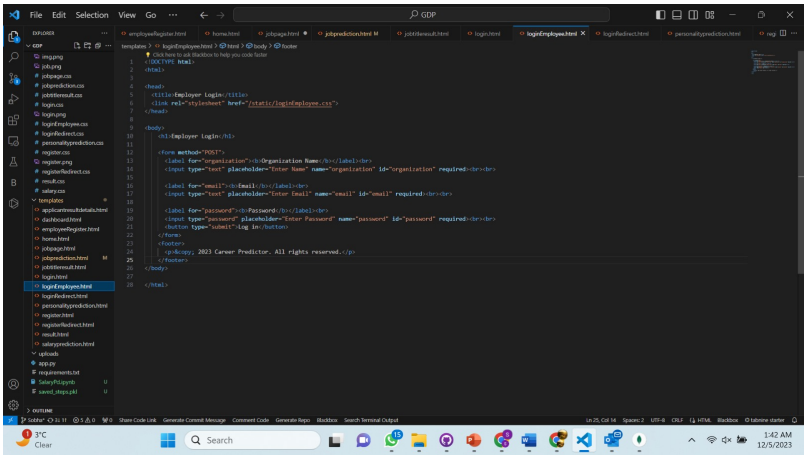
Login's Page:

1. **Employee Page**: This webpage is for employee login having fields of email and password. It uses a form to submit data and includes validation for user input. If there are errors, a message will display on the page. The design is likely styled using a separate CSS file.



HTML link to Employee Login: Link
CSS link to Employee Login: Link

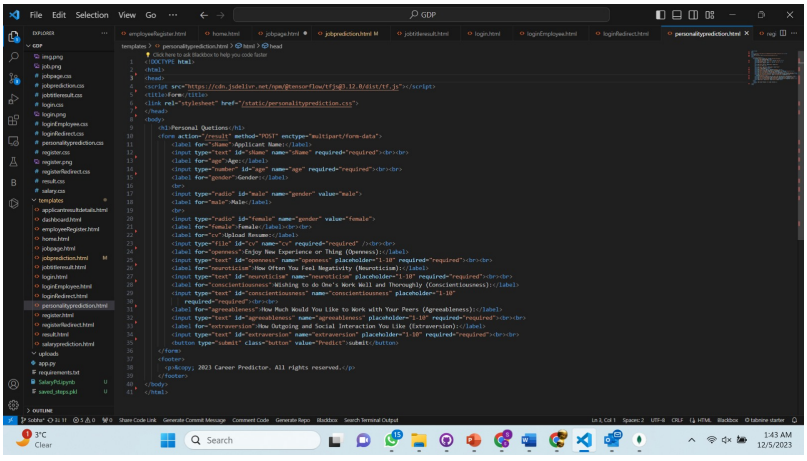
2. **Employer's Page**: This webpage is for employer login having fields of organization's name, email, and password. Users can enter their organization's name, email, and password to log in, submitting the data through a form using the POST method. The page may have design styles applied through an external CSS file linked in the head section.



HTML link to Employer Login: Link
CSS link to Employer Login: Link

Personality Prediction Page:

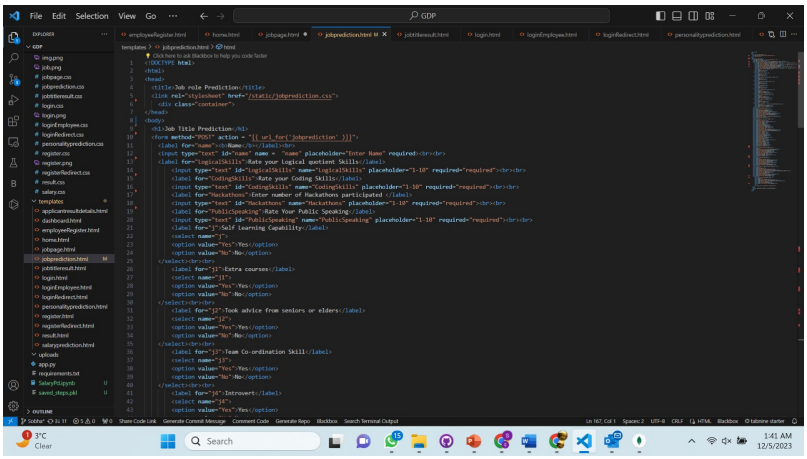
This webpage designs a form for personality prediction, asking for user details like name, age, gender, and resume upload. It includes fields to rate their personality traits on a scale of 1 to 10. By submitting, the entered data likely goes to a server for processing result, potentially using TensorFlow.js for predictive analysis and the result will be displayed.



HTML link to Personality Prediction: Link
CSS link to Personality Prediction: Link

Job Title Prediction Page:

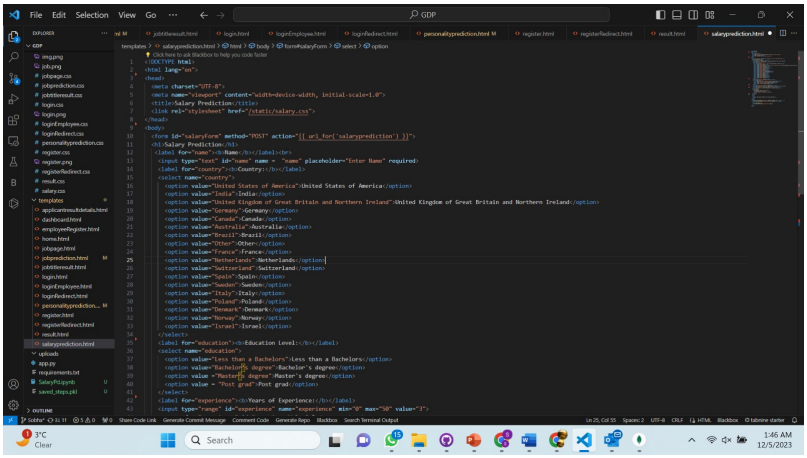
This webpage creates a form for predicting job titles, asking users to rate their skills, experiences, and preferences. It includes input fields, dropdowns, and rating scales for various aspects. By submitting, this data is likely sent to a server for job title prediction, potentially utilizing styles from an external CSS file.



HTML link to Job Title Prediction: Link
CSS link to Job Title Prediction: Link

Salary Prediction Page:

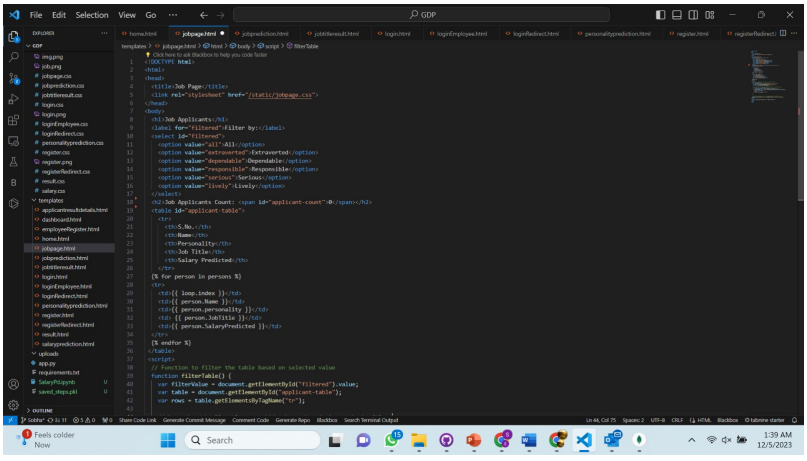
This webpage predicts salaries by asking for user details like name, country, education level, and years of experience. Users select options via dropdowns and a range slider. Clicking on calculating salary likely submits the data for prediction, displaying the estimated salary (if available) and having a done button to navigate to a dashboard. The form may use styles from an external CSS file and includes embedded javascript to handle the experience and form submission.



HTML link to Salary Prediction: Link
CSS link to Salary Prediction: Link

Job Applicant's Page:

This webpages has a job applicants interface with a dropdown for personality-based filtering. It exhibits applicant details in a table, including serial numbers, names, personality types, job titles, and predicted salaries. JavaScript functions enable filtering applicants by personality traits, offering users a dynamic view of applicant profiles based on their chosen trait category. Styling is managed through an external CSS file jobpage.css.



HTML link to Job Applicant's: Link
CSS link to Job Applicant's: Link