SKILLS AND JOB RECOMMENDER APPLICATION

NALAIYA THIRAN PROJECT BASED LEARNING

ON

PROFESSIONAL READINESS FOR INNOVATION, EMPLOYABILITY AND ENTREPRENEURSHIP

A PROJECT REPORT

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ABSTRACT

Machine learning is a sub-field of data science that concentrates on designing algorithms that can learn from and make predictions on the data. Presently recommendation frameworks are utilized to take care of the issue of the overwhelming amount of information in every domain and enable the clients to concentrate on information that is significant to their area of interest. One domain where such recommender systems can play a significant role to help college graduates to fulfill their dreams by recommending a job based on their skill set. Currently, there are plenty of websites that provide heaps of information regarding employment opportunities, but this task is extremely tedious for students as they need to go through large amounts of information to find the ideal job. And many students are not aware of which job is suitable for them. Nowadays, the IT fields are in a boom. Many engineering students are learning some technical skills by doing some courses but they don't know which skill is for which job. Simultaneously, existing job recommendation systems only take into consideration the domain in which the user is interested while ignoring their profile and skillset, which can help recommendobs that are tailor-made for the user. This paper examines the user's resume then compares the knowledge of degree, soft skills, hard skills, and the projects he has done and then only the system recommends the jobs for that user. The system not only recommends the jobs but also shows the score of his/her resume for the respective job. Then, the system also recommends skills to improve the scores of theirMachine learning is a subfield of data science that concentrates on designing algorithms that can learn from and make predictions on the data. Presently recommendation frameworks are utilized to take care of the issue of the overwhelming amount of information in every domain and enable the clients to concentrate on information that is significant to their area of interest. One domain where such recommender systems can play a significant role to help college graduates to fulfill their dreams by recommending a job based on their skill set. Currently, there are plenty of websites that provide heaps of information 4 regarding employment opportunities, but this task is extremely tedious for students as they need to go through large amounts of information to find the ideal job. And

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1. Introduction

1.1 overview

The fast growth of the Internet caused a matching growth of the amount of available online information that increased the need to expand the ability of users to manage all this information. This encourages a substantial interest in specific research fields and technologies that could benefit the managing of this information overload. The most important fields are Information retrieval and Information filtering. Information retrieval deals with automatically matching use's information and Information filtering aims to assist users eliminating unwanted information (Hanani et al., 2001). The latest technology designed to fight information overload is the recommender systems that originated from cognitive science, approximation theory, information retrieval, forecasting theories and also related to management science and to consumer choice modeling in marketing (Adomavicius and Tuzhilin, 2005). The recommender systems used to determine the interested items for a specific user by employing a variety of information resources that is related to users and items. In the mid-1990s, the term recommender system was published for the first time in information system literature (Resnick and Varian, 1997). Many researches in industry and academic areas have been known to develop new approaches for recommender systems in the last decade. The interest in this area still remains high because it is composed of a problem-rich research area and has a wealth of practical applications (Adomavicius and Tuzhilin, 2005). Recommender systems are being broadly accepted in various applications to suggest products, services, and information items to latent customers. Many e-commerce applications join recommender systems in order to expand customer services, increase selling rates and decrease customers search time (Schafer et al., 1999). For example, a wide range of companies such as the online book retailer Amazon.com (Linden et al., 2003), books (Mooney and Roy, 2000), and news articles (Das et al., 2007). Additionally, Microsoft provides users many recommendations such as the free download products, bug fixes and so forth (Shani and Gunawardana, 2011). All these companies have successfully set up commercial recommender systems and have

increased web sales and improved customer fidelity. Moreover, many software 5128 Int. J. Phys. Sci. developers provide stand-alone generic recommendation technologies. The top providers include Net Perceptions, Epiphany, Art Technology Group, Broad Vision, and Blue Martini Software (Huang et al., 2007).

For many years, information system supports in human resource management have been mainly restricted in storing and tracking applicants‟ data through the applicant management systems. These systems support the internal workflows and communication processes between the human resource management department and the other departments. Recently, the increased amount of digital information and the emergence of ebusiness reform the way companies conduct business in different aspects. Initially, simple solutions are applied such as posting the job ads on the career unit of the corporate website. Then, based on the experiences gained from these first implementations, the opportunities are realized, establishing other changes and hence, implementing enhanced e-recruitment platforms. The Internet-based online recruiting platform or erecruitment platform is one of the most successfulbusiness changes, which changed the way companies employ candidates. These platforms spread in the recent years because the recruiting of the appropriate person is a challenge faced by most companies, as well as the unavailability of certain candidates in some skill areas has long been identified as a major obstacle to companies success (Laumer and Eckhardt, 2010). The online channels like Internet job portal, social media applications or a firm‟s career website have driven this development. While the companies established job positions on these portals, job-seeker uses them to publish their profiles. For each posted job, thousands of resumes are received by companies. Consequently, a huge volume of job descriptions and candidate resumes are becoming available online. This vast volume of information gives a great opportunity for enhancing the matching quality; this potential is unused since search functionality in recruiting applications is mainly restricted to Boolean search method. The need increases for applying the recommender system technologies that can help recruiters to handle this information efficiently (Färber et al., 2003; Yi et al., 2007). Many researches have been conducted to discuss different issues related to the recruiting problem as well as, the application of recommender system technologies. However, job recommendation is still a challenging domain and a growing area of research. In order to support this research area, we conduct a comprehensive survey for job

recommender systems. We will discuss the e-recruitment problem and present the stateof-art of solutions tailored to candidates/job matching.the phases of the recruitment such as the handling of candidates‟ applications and the pre-selection of candidates. However, a best fit between job and candidates depends on underlying aspects that are hard to measure. These underlying aspects are a significant reason why information systems have not been extensively used in the area of personnel selection so far.

Mostly, IS technology is used to pre-select applicants based on Boolean search method. This method used queries contain a combination of key words that define skill requirements in order to determine those candidates that match with search criteria. Such type of skill matching is applied in numerous e-recruiting applications. However, as mentioned above, the simple filter techniques such as Boolean search method cannot be sufficient to realize the complexity of a person-job fit as selection decisions often depend on underlying attributes such as personal characteristics or social skills that cannot be put into an operational way easily (Malinowski et al., 2006). Additionally, the need to understand the job requirements, in terms of the skills that are mandatory and those that are optional but preferable, the experience criteria if any, preference for the location of the candidate etc. Consequently, the major challenge faced e-recruiting applications as identified by the literature analysis is the large number of low qualification of applicants that match the search criteria (Singh et al., 2010).

The recommender systems techniques can be used to address the problem of information overload by prioritize the delivery of information for individual users based on their learned preferences (Lee and Brusilovsky, 2007). Additionally, the success of personalization technologies depends critically on the existence of comprehensive user profiles that precisely capture users‟ interests (Rafter and Smyth, 2001) and the perfect matching method. Moreover, the recommender systems could use historical rating information to determine which type of job required which type of candidate characteristics in the past in order to be rated positively by the recruiter. This information could then be used to predict the match between job and previously not rated candidates. The need of applying the recommender system techniques for selection process can be motivated from different perspectives. While we interested in how people find an appropriate job,

other researchers are interested in how change the ways people effectively collaborate once the candidate is recruited. This increases the requirements to select candidates that not only fit with the requirements of the job but also with the team members in terms of interpersonal compatibility (Malinowski et al., 2006).

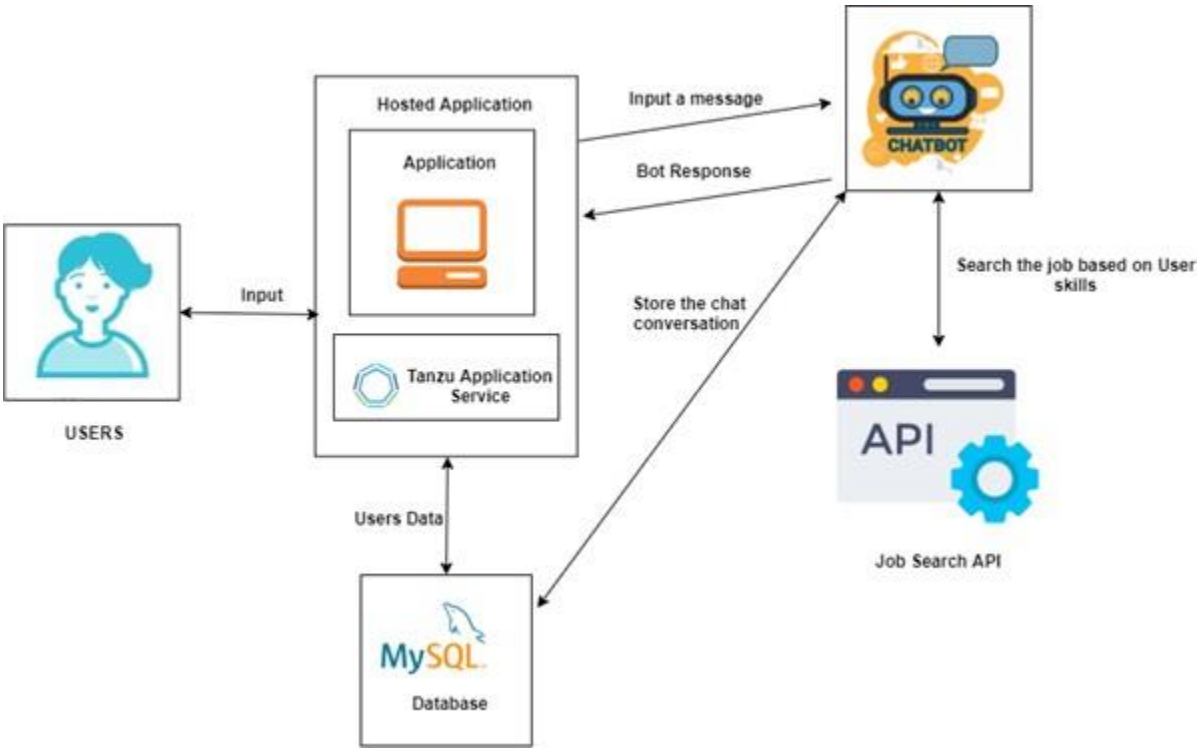

Figure 1.1 Skill/Job Recommender Application

1.2 purpose

Despite the differences among the different job recommender systems, most of them have the same general architecture, as the purposed model does. Therefore, before describing in detail the purposed model, its general architecture is first introduced in the following subsection.

1.2.1 The General Architecture of Recommendation Systems

The general architecture of recommendation systems consists of three

basic elements: the input data, the recommendation technique, and the recommendation output (Fig. 1).

The input is the users‟ preferences used for recommendation such as user profile. The input captures the main preferences of users and is the content of the user profile, which can contain one or more of three types of data: 1) individual information such as educational experience, working experience and skills; 2) user‟s historical behaviors regarding job application and collecting job posts, e.g. CASPER and eRecruiter; and 3) user preference captured based on a description of a preferred job, e.g. CASPER, or based on mining the resume of the users, e.g. PROSPECT and eRecruiter. The input data also include the available jobs provided by recruiters.

Fig. 1. The General Architecture of Recommendation System

The recommendation technique is the core of the recommender system, and it refers to the recommendation strategy to use. In the literature, several techniques have been introduced based on the following filtering techniques:

1. Collaborative filtering makes a user-to-user comparison in order to suggest preferred items from similar users. For suggesting items, collaborative filtering recommender systems search for users with similar taste. Most often, such recommender systems are based on ratings. These ratings are then used to match similar users; for example, two users have the same rating for the same article. Afterwards, the preferences of similar users are re-used for recommending items. An example of collaborative filtering

recommenders is [15].

2. Content-based filtering tries to find items that are similar to items the user likes. Content-based recommender systems analyze item descriptions to identify items of particular interest to the user. This type of recommender system may be used in a variety of different domains, such as web page recommendations, television programs, news articles, and social media content. This approach has its roots in the information retrieval area, as methods for searching for documents are involved. Compared to traditional information retrieval applications, these recommender systems require user profiles, which encode the user‟s preferences. An example of collaborative filtering recommenders is [4].

3. Knowledge-based uses additional knowledge in order to infer items that best match the user‟s needs. Knowledge-based recommender systems use knowledge about the items, the users and on how to map users‟ needs to items‟ features, the so-called functional knowledge. Knowledge-based recommender systems suggest products based on inferences about a user‟s needs and preferences that are derived explicitly from their mapping to product features [14]. An example of such recommenders is [16].

4. Hybrid filtering combines two or more of the above techniques to achieve better performance. An example of these filtering is [17].Different systems may employ different recommendation strategies approaches based on their own user profiles. For example, PROSPECT uses content filtering techniques while CASPER applies hybrid techniques based on content and collaborative filtering techniques.After taking the user profile as the input and applying the recommendation technique, the recommendation system outputs the recommendation results that satisfy the desires of users. The output is usually in the form of a list of recommended jobs. It may also include “You Maybe Also Like” and “What Others Looking” jobs.

1.2.2 The Purposed Model

Thepurposed model is based on the general architecture of a recommendation system presented in the previous section (see Fig. 2). The details of its three elements are provided.

- **Input**

  This element consists of the job seeker and job vacancies data. The job seekers data are the preferences of the people who are looking for jobs. In the proposed model two main preferences have been identified: job title and location. The location in the proposed model is central because the proposed model is a map-based model. The job vacancies data are the jobs postings to be retrieved from common job boards‟ sites.

- **Recommender**

  This element gets the job seeker preferences, i.e., job title and location as well as the job retrieved from job boards‟ sites and recommend the most similar jobs. The recommendation technique in the proposed model is content-based.

  The basic approach in content-based filtering is to match similarity between two texts based on the count of common words between the two documents. This provides a measure of the „Euclidean distance‟ between the two documents. As the size of documents increases, the number of common words would increase, even if the documents are related to the same topic/idea. The Euclidean distance, therefore, stops being a good measure of the match between the documents. However, a measure that can indicate the closeness of two documents irrespective of their size is the cosine of the angle between two associated vectors, i.e. arrays having word counts in the two documents, projected in a multidimensional space (Fig. 3). The axes correspond to search words being compared. It is

obvious that we might have a large Euclidean distance between very similar vectors, i.e. between vectors with a small angle (hence a larger value of cosθ). The cosine gives a normalized measure of the match: 0 for no match to 1 for a perfect match.

- **Output**

The output is a visualizer element which is responsible for providing a map support for the recommended jobs. The visualizer gets the recommended jobs locations and processes them and then.

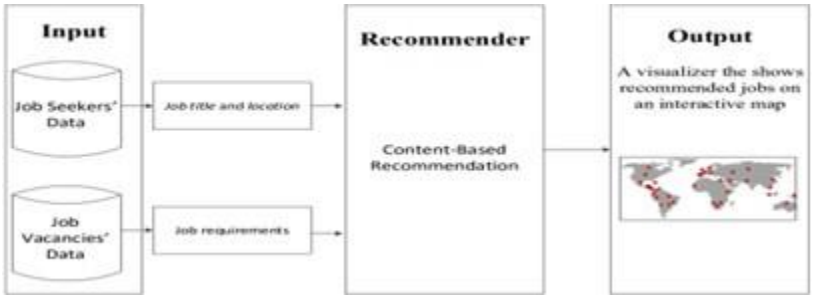

Fig. 2. The Architecture of the Proposed Model.

2. LITREATURE SURVEY

2.1 Existing problem

Instead of measuring how applicants would perform in expected, everyday situations, cognitive ability tests assess how candidates would perform in more unexpected scenarios. They do this by evaluating a person's ability to think abstractly when using numerical and verbal reasoning skills. Often, game-based assessments are used to measure cognitive ability. This format is more approachable for the candidate, and the process is typically much faster than the more traditional cognitive skill tests.

Employers often use skills assessment tests during the hiring process to determine if candidates are a good match for the open position. Even if you have showcased both your hard and soft skills on your resume with facts and figures, you may still need to sit this test. Knowing what to expect from this type of assessment tests can help you prepare for and clear them. In this article, we define a skills assessment test with examples, describe the different types of tests and list the top 10 strategies for taking these tests.

Fig 2.1 Existing problem

2.2 References

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2.3 Problem Statement Definition

A problem statement addresses issues in a timely and efficient manner. They help professionals break down complex situations into tangible goals that they can then communicate throughout an organisation. In every workplace, problems are inevitable. Thus, such a statement is an effective tool to put into practice so that employees recognise issues before they disrupt multiple functions of the business.

In this article, we discuss what a problem statement is, why they are important, how to write one and provide a comprehensive template and example for your reference.

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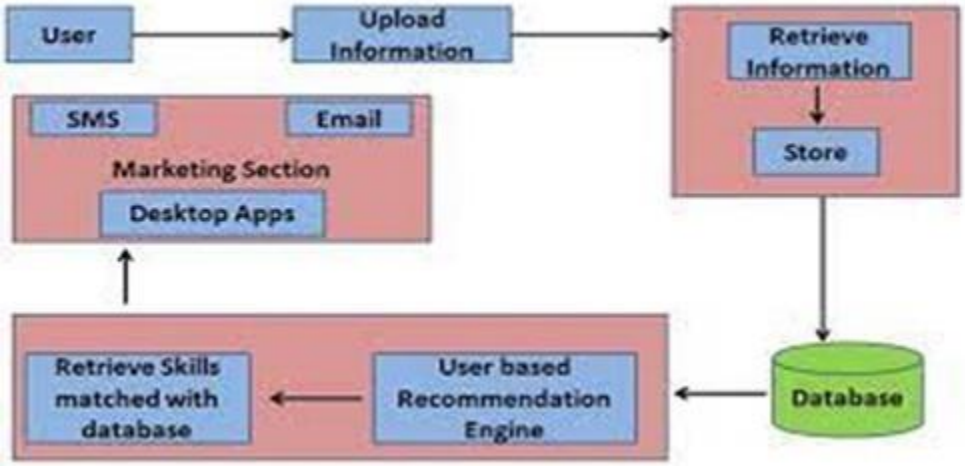


Fig 2.3 Problem Statement Definition

3. IDEATION AND PROPOSED SOLUTION

This article presents a recommender system that aims to help job seekers to find suitable jobs. First, job offers are collected from job search websites then they are prepared to extract meaningful attributes such as job titles and technical skills. Job offers with common features are grouped into clusters. As job seeker like one job belonging to a cluster, he will probably find other jobs in that cluster that he will like as well. A list of top n recommendations is suggested after matching data from job clusters and job seeker behavior, which consists on user interactions such as applications, likes and rating.

This element consists of the job seeker and job vacancies data. The job seekers data are the preferences of the people who are looking for jobs. In the proposed model two main preferences have been identified: job title and location. The location in the proposed model is central because the proposed model is a map-based model. The job vacancies data are the jobs postings to be retrieved from common job boards‟ sites.

3.1 Empathy Map Canvas

Empathy maps should be used throughout any UX process to establish common

ground among team members and to understand and prioritize user needs. In user-centered design, empathy maps are best used from the very **beginning of the design process**.

Both the process of making an empathy map and the finished artifact have important benefits for the organization:

- **Capture who a user or persona is.** The empathy-mapping process helps distill and categorize your knowledge of the user into one place. It can be used to:
    - Categorize and make sense of qualitative research (research notes, survey answers, user-interview transcripts)
    - Discover gaps in your current knowledge and identify the types of research needed to address it. A sparse empathy map indicates that more research needs to be done.
    - Create personas by aligning and grouping empathy maps covering individual users

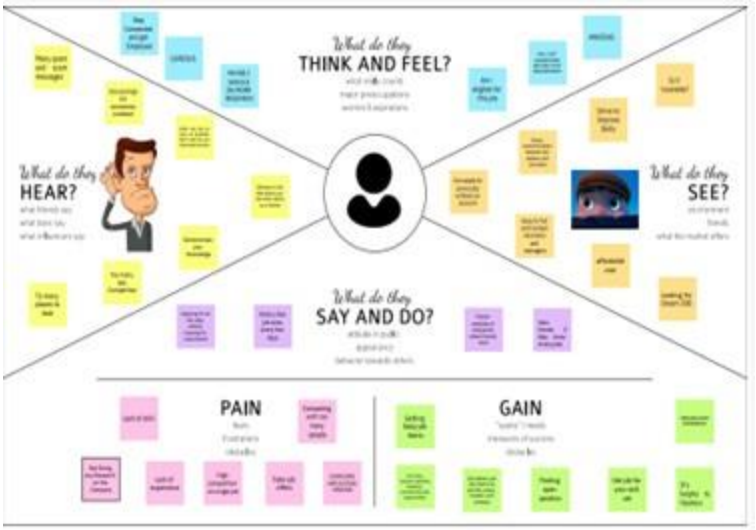


Fig 3.1 Empathy Map Canvas

3.2 IDEATION AND BRAIN STORMING

Ideation is often closely related to the practice of brainstorming, a specific technique that is utilized to generate new ideas. A principal difference between ideation and brainstorming is that ideation is commonly more thought of as being an individual pursuit, while brainstorming is almost always a group activity. Brainstorming is usually conducted by getting a group of people together to come up with either general new ideas or ideas for solving a specific problem or dealing with a specific situation.

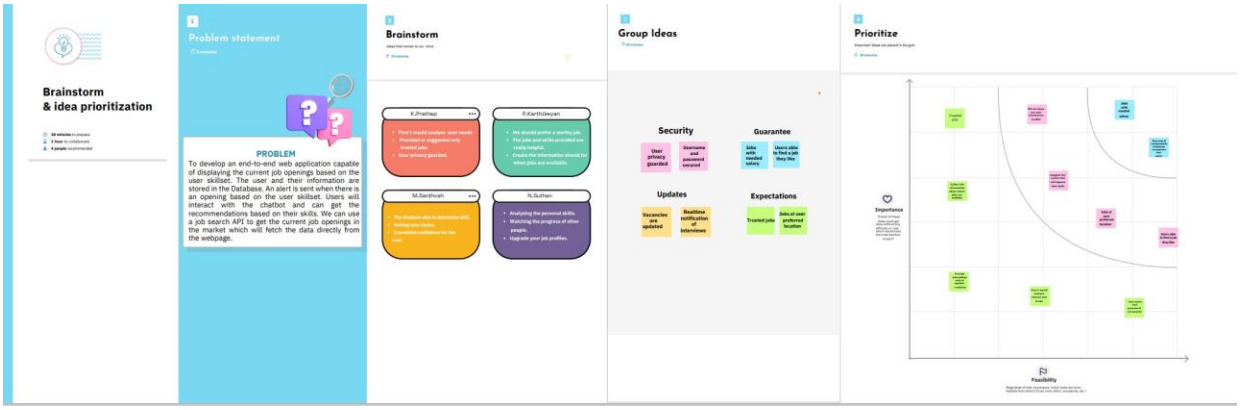
For example, a major corporation that recently learned it is the object of a major lawsuit may want to gather together top executives for a brainstorming session on how to publicly respond to the lawsuit being filed.

Participants in a brainstorming session are encouraged to freely toss out

whatever ideas may occur to them. The thinking is that by generating a large number of ideas, the brainstorming group is likely to come up with a suitable solution for whatever issue they are addressing.

The lines between ideation and brainstorming have become a bit more blurred with the development of several brainstorming software programs, such as Brightidea and Ideawake. These software programs are designed to encourage employees of companies to generate new ideas for improving the companies' operations and, ultimately, bottom-line profitability.

The programs often combine the processes of ideation and brainstorming in that individual employees can use them, but companies may simulate brainstorming sessions by having several employees all utilize the software to generate new ideas intended to address a specific purpose



3.3 PROPOSED SOLUTION

Proposed Solution :

S. No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Having lots of skills but wondering which job will best suit you? Don't need to worry! We have come up with a skill recommender solution through which the fresher or the skilled person can log in and find the jobs by using the search option or they can directly interact with the chatbot and get their dream job. To develop an end-to-end web application capable of displaying the current job openings based on the user skillset. The user and their information are stored in the Database. An alert is sent when there is an opening based on the user skillset. Users will interact with the chatbot and can get the recommendations based on their skills. We can use a job search API to get the current job openings in the market which will fetch the data directly from the webpage.
2.	Idea / Solution description	The contributions of this work are threefold, we: i) made publicly available a new dataset formed by a set of job seekers profiles and a set of job vacancies collected from different job search engine sites ii) put forward the proposal of a framework for job recommendation based on professional skills of job seekers iii) carried out an evaluation to quantify recommendation abilities of two state-of-the art methods, considering different configurations, within the proposed framework. We thus present a general panorama of job recommendation task aiming to facilitate research and real-world application design regarding this important issue.
3.	Novelty / Uniqueness	The best position are suggested to any person according to her skills. While the position of known profiles are assumed

		should be noted that there are usually multiple advisable positions corresponding to a set of skills.A recommendation system should return a set of most likely positions and all of them can be equally valid. The recommendation method we use is simply based on representing both positions and profiles as comparable vectors and seeking for each profile the positions with the most similar vectors.
4.	Social Impact / Customer Satisfaction	Students will be benefited as they will get to know which job suits them based on their skill set and therefore Lack of Unemployment can be reduced.
5.	Business Model (Revenue Model)	We can provide the application for job seekers in a subscription based and we can share the profiles with companies and generate the revenue by providing them best profiles.
6.	Scalability of the Solution	Data can be scaled up and scaled down according to number of current job openings available.

3.4 PROBLEM SOLUTION FIT

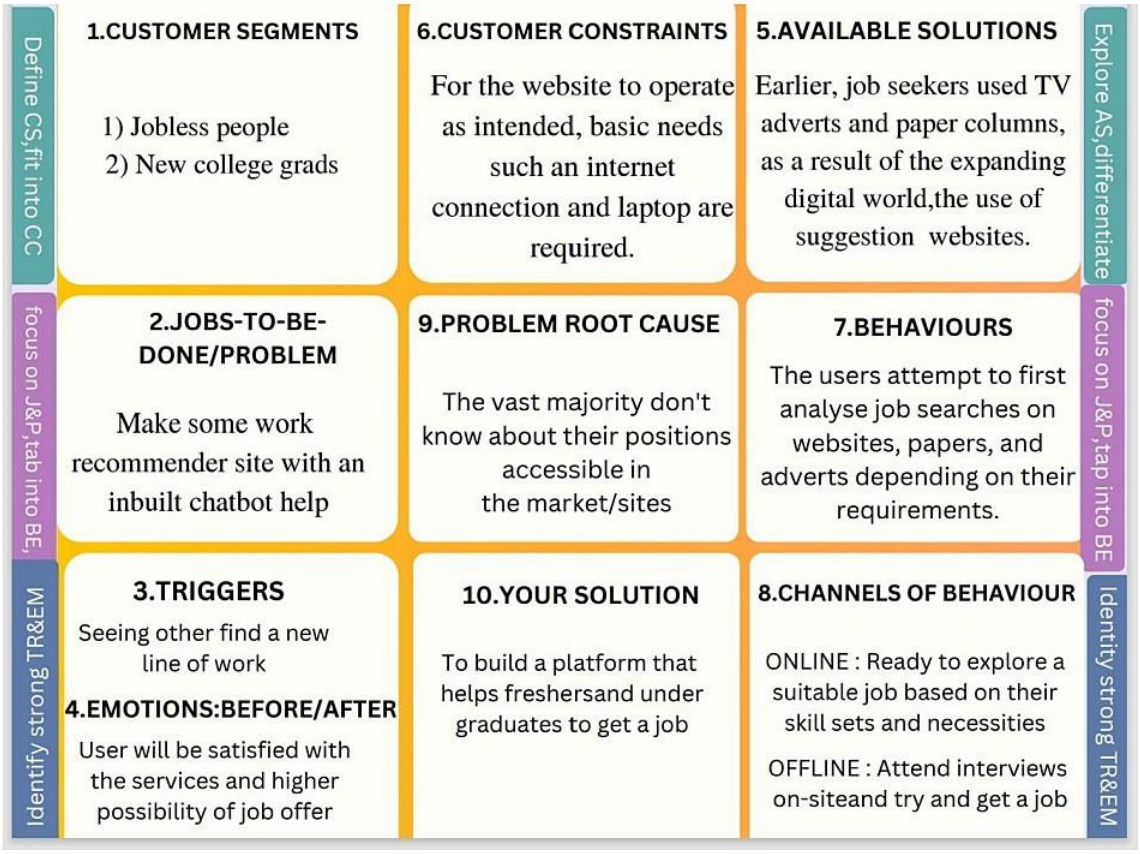
Problem – Solution Fit Template:

The Problem-Solution Fit simply means that you have found a problem with your customer and that the solution you have realized for it actually solves the customer's problem. It helps entrepreneurs, marketers and corporate innovators identify behavioral patterns and recognize what would work and why

Purpose:

- ❑ Solve complex problems in a way that fits the state of your customers.
- ❑ Succeed faster and increase your solution adoption by tapping into existing mediums and channels of behavior.
- ❑ Sharpen your communication and marketing strategy with the right triggers and messaging.
- ❑ Increase touch-points with your company by finding the right problem-behavior fit and building trust by solving frequent annoyances, or urgent or costly problems.
- ❑ **Understand the existing situation in order to improve it for your target group.**

Template:


Define CS,fit into CC
1.CUSTOMER SEGMENTS
1) Jobless people
2) New college grads
6.CUSTOMER CONSTRAINTS
For the website to operate as intended, basic needs such an internet connection and laptop are required.
5.AVAILABLE SOLUTIONS
Earlier, job seekers used TV adverts and paper columns, as a result of the expanding digital world,the use of suggestion websites.
Explore AS,differentiate
focus on J&P,tab into BE,
2.JOBS-TO-BE-DONE/PROBLEM
Make some work recommender site with an inbuilt chatbot help
9.PROBLEM ROOT CAUSE
The vast majority don't know about their positions accessible in the market/sites
7.BEHAVIOURS
The users attempt to first analyse job searches on websites, papers, and adverts depending on their requirements.
focus on J&P,tap into BE
Identify strong TR&EM
3.TRIGGERS
Seeing other find a new line of work
4.EMOTIONS:BEFORE/AFTER
User will be satisfied with the services and higher possibility of job offer
10.YOUR SOLUTION
To build a platform that helps freshersand under graduates to get a job
8.CHANNELS OF BEHAVIOUR
ONLINE : Ready to explore a suitable job based on their skill sets and necessities
OFFLINE : Attend interviews on-siteand try and get a job
Identify strong TR&EM

4. REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

S. No	FUNCTIONAL REQUIREMENT (Epic)	SUB REQUIREMENT (Story)
1)	Sign In / Login	Register with username, password
2)	Profile Registration	Register with username, password, email, qualification, skills. This data will be stored in a database.
3)	Job profile display	Display job profiles based on availability, location ,skills
4)	Chatbot	A chat on the webpage to solve user queries and issues
5)	Job registration	A copy of the company the user applied for with its registration/description details will be sent to the registered email id.
6)	Logout	

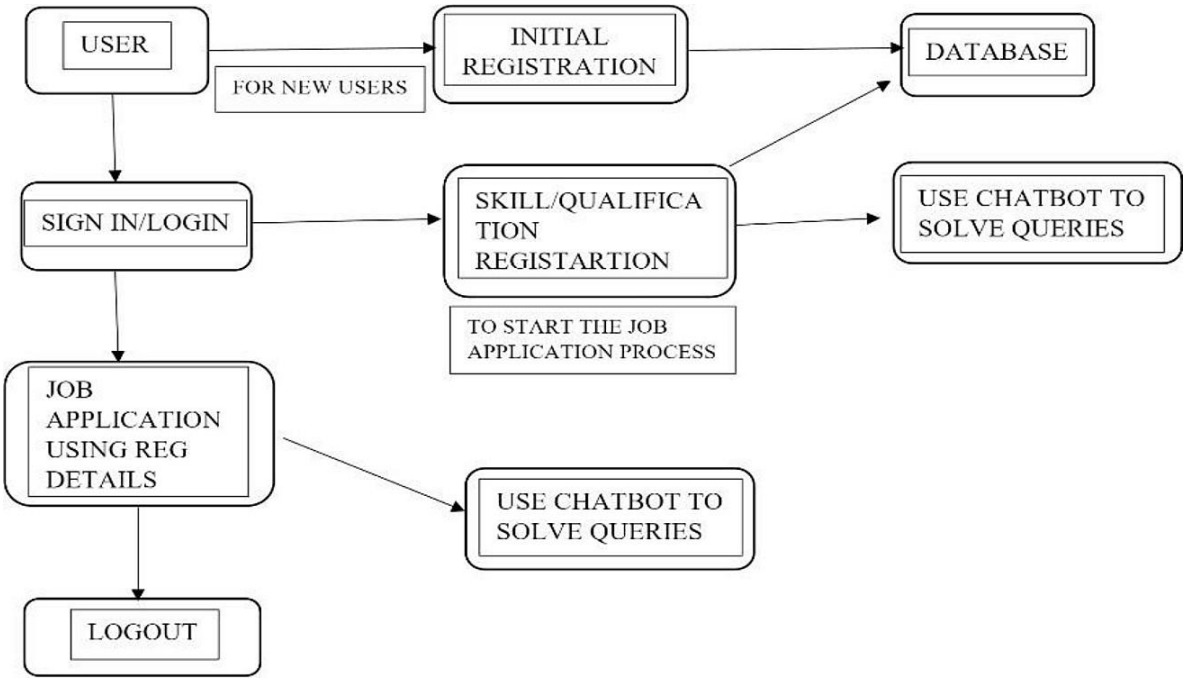
4.2 NON - FUNCTIONAL REQUIREMENT

Following are the non-functional requirements of the proposed solution

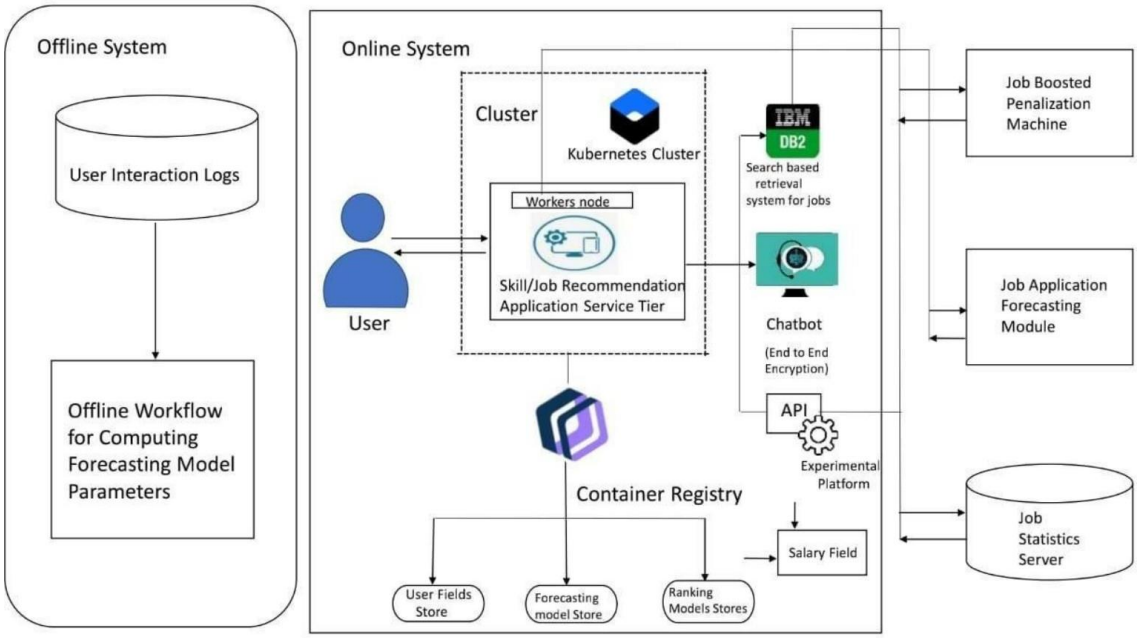
S. No	NON-FUNTIONAL REQUIREMENT	DESCRIPTION
1)	Usability	The webpage will be designed in such a way that any non-technical user can easily navigate through it and complete the job registration work. (Easy and Simple design.)
2)	Security	Using of SSL certificate (Python Flask to Cloud connect) will provide security to the project. Database will be safely stored in DB2.
3)	Reliability	To make sure the webpage doesn't go down due to network traffic.
5)	Availability	This webpage will be available to all users (network connectivity is necessary) at any given point of time.
6)	Scalability	Increasing the storage space of database can increase the number of users. Add some features in future to make the webpage unique and attractive.
4)	Performance	Focus on loading the webpage as quickly as possible irrespective of the number of user/integrator traffic.

5. PROJECT DESIGN

5.1 DATA FLOW DIAGRAM



5.2 TECHNICAL ARCHITECTURE



5.3 USER STORIES

User Stories :

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2
		USN-4	As a user, I can register for the application through Gmail	I can receive confirmation email & click confirm	Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email & password	I can access my account / dashboard	High	Sprint-1
	Dashboard	USN-6	Create a model set that contains those models, then assign it to a role.	Assign that group to the appropriate roles on the Roles page	High	Sprint-1
Customer (Web user)	Identity-Aware	USN-7	Open, public access, User-authenticated access, Employee-restricted access.	Company public website. App running on the company intranet. App with access to customer private information.	High	Sprint-1
Customer Care Executive	Communication	USN-8	A customer care executive is a professional responsible for communicating the how's and why's regarding service expectations within a company.	For how to tackle customer queries.	Medium	Sprint-1
Administrator	Device management	USN-9	You can Delete/Disable/Enable devices in Azure Active Directory but you cannot Add/Remove Users in the directory.	Ease of use.	Medium	Sprint-1

6. PROJECT PLANNING AND SCHEDULING

Sprint Delivery planning:

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	K.Prathap P.Karthikeyan
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	K.Prathap P.Karthikeyan
Sprint-2		USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	K.Prathap P.Karthikeyan
Sprint-3		USN-4	As a user, I can register for the application through Gmail	I can receive confirmation email & click confirm	Medium	M.santhosh N.suthan
Sprint-2	Login	USN-5	As a user, I can log into the application by entering email & password	I can access my account / dashboard	High	K.Prathap P.Karthikeyan
Sprint-2	Dashboard	USN-6	Create a model set that contains those models, then assign it to a role.	Assign that group to the appropriate roles on the Roles page	High	M.santhosh N.suthan
Sprint-4	Identity-Aware	USN-7	Open, public access, User-authenticated access, Employee-restricted access.	Company public website. App running on the company intranet. App with access to customer private information.	High	M.santhosh N.suthan
Sprint-1	Communication	USN-8	A customer care executive is a professional responsible for communicating the how's and why's regarding service expectations within a company.	For how to tackle customer queries.	Medium	K.Prathap P.Karthikeyan

Project Tracker, Velocity & Burndown Chart: (4 Marks)

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	30 Oct 2022	04 Nov 2022	20	04 Nov 2022
Sprint-2	20	6 Days	04 Nov 2022	09 Nov 2022	18	09 Nov 2022
Sprint-3	20	6 Days	09 Nov 2022	14 Nov 2022	20	14 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	19	19 Nov 2022

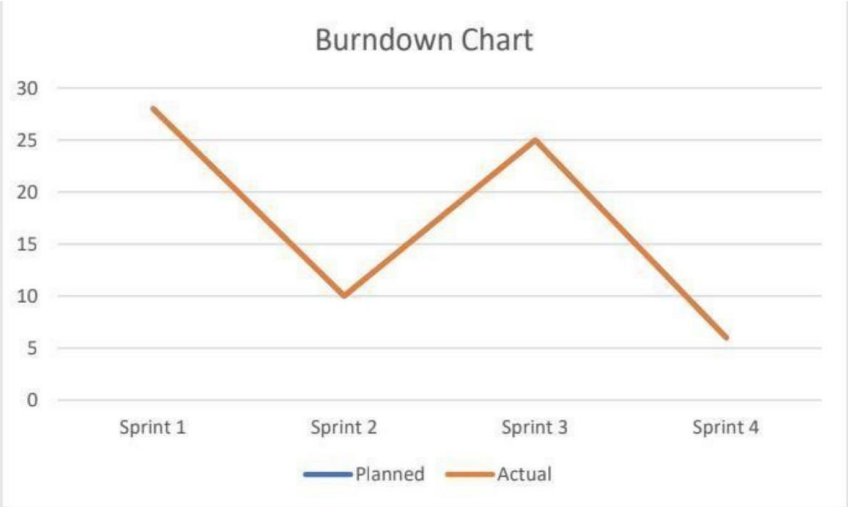
Velocity:

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

Burndown Chart:

A burn down chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. However, burn down charts can be applied to any project containing measurable progress over time.
Goal: 60hours in 5days



7. CODING AND SOLUTION

7.1 FEATURE - 1

Pages overview :

1. Homepage

Home page is the introduction page of the website

```
1  {% extends "bootstrap/base.html" %}
2  {% block title %}Home - Skills / JobsRecommender{% endblock %}
3  {% block styles %} 4
{{super()}}
5  <link rel="stylesheet"href="{{url_for('static', filename='style.css')}}">
6  <link rel="stylesheet"href="{{url_for('static', filename='style.css')}}">
7  <link
   href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/d
   ist/css/bootstrap.min.css" rel="stylesheet" integrity="sha384-
   Zenh87qX5JnK2Jl0vWa8Ck2rdkQ2Bzep5IDxbcnCeuOxjzrPF/et
   3URy9Bv1WTRi" crossorigin="anonymous">
8  {% endblock %}
9  {% block content %} 10
11<!_____
   _____Nav_____


   -->
```

```
12   <div id="body">
13       <div id="NAV">
14     <nav class="navbar navbar-expand-lg navbar-light">
15 <a class="navbar-brand"
   href="www.google.com"><h3 id="nav-
   p">Mr.Perk</h3></a>
16 <button class="navbar-toggler" type="button" data-bs-toggle="collapse"
   data-bs- target="#navbarNav" aria-controls="navbarNav" aria-
   expanded="false" aria-label="Toggle navigation">
17             <span class="navbar-toggler-icon"></span>
18         </button>
19 <div class="collapse navbar-collapse justify- content-end"
   id="navbarNav">
20             <ul class="navbar-nav">
21                 <li class="nav-item">
22 <a class="nav-link" href="{{url_for('login')}}"><i class="fa-solid fa- user
   profile-img fa-lg AC1"><p class="AC1 AC">Login</p></i></a>
23             </ul>
24         </div>
25</nav>
26           </div>
27     <!_____
   _____Nav_____


   _____>
28   <section id="title">
29     <center>

   ----------
   ----------
```

```
30      <div class="container-fluid "> 31<div
class="row">
32      <div class = "col-lg-6">
33 <img class = "Title-image" src="{{url_for('static',
    filename='images/happy.png')}}" alt="happy-mockup">
34      </div>
35          <div class = "col-lg-6">
36 <h1 id ="meet">Find The Jobs According To Your Skills.</h1>
37 <button type="button" class="btn btn-secondary btn btn-primary btn-lg
    Downloadbtn"><i class="fa- solid fa-magnifying-glass-arrow-right
    Downloadbtn "></i></i> <a style="color:#fff" class="Downloadbtn"
    href="{{url_for('login')}}">Find Jobs</a></button>
38 <button type="button" class="btn btn-secondary btn btn-primary btn-lg
    Downloadbtn"><i class="fa- solid fa-magnifying-glass-arrow-right
    Downloadbtn "></i></i> <a style="color:#fff;" class="Downloadbtn"
    href="{{url_for('corporate_login')}}">Post job</a></button>
39      </div>
40</div>
41      </center>
42</section>
43 </div> 44
45<!-- Features --> 46<section
id="features"> 47<div
class="container">
```

```
48     <div class="row">
49         <div class="col-lg-4 featurebox">
50 <i class="icon fa-solid fa-circle-check fa- 6x"></i>
51             <h3>Automated Notifications.</h3>
52 <p>Automated emails to tell you when new jobs matching your search
   criteria are posted will help you do more with your life.</p>
53         </div>
54         <div class="col-lg-4 featurebox">
55 <i class="icon fa-solid fa-bullseye fa- 6x"></i>
56             <h3>Recruiters Come to You</h3>
57 <p>You can post your resume on job boards, allowing prospective
   employers looking for particular talents to find your information and
   invite you to apply</p>
58         </div>
59         <div class="col-lg-4 featurebox">
60             <i class="icon fa-solid fa-heart fa-6x"></i>
61             <h3>More Job Listings.</h3>
62 <p>By signing up for several job boards, you are going to see more job
   listings, giving you more opportunities to find the right job.</p>
63         </div>
64     </div>
65</div>
66</section> 67
68
69<!-- Testimonials -->
```

```
70
71<section id="testimonials">
72 <div id="carouselExampleControlsNoTouching" class="carousel
   slide" data-bs-touch="false">
73         <div class="carousel-inner">
74             <div class="carousel-item active">
75 <h2>Recuiters Will Come To You Mr.Perks Will Also Have Automated Chat-
   Box Option</h2>
76 <img class='testimonials-image' src="{{url_for('static',
   filename='images/office.png')}}" alt="dog-profile">
77             </div>
78             <div class="carousel-item">
79 <h2 class="testimonial-text">You Are Job Seekar I Think You Arrived At
   Right Place.</h2>
80 <img class="testimonials-image" src="{{url_for('static',
   filename='images/jobseek.png')}}" alt="gen-profile">
81             </div>
82         </div>
83 <button class="carousel-control-prev" type="button" data-bs-
   target="#carouselExampleControlsNoTouching" data-bs- slide="prev">
84 <span class="carousel-control-prev-icon" aria- hidden="true"></span>
85             <span class="visually-hidden">Previous</span>
86         </button>
87 <button class="carousel-control-next" type="button" data-bs-
   target="#carouselExampleControlsNoTouching" data-bs-
```

```
    slide="next">
88 <span class="carousel-control-next-icon" aria- hidden="true"></span>
89              <span class="visually-hidden">Next</span>
90          </button>
91      </div> 92
93</section> 94
95
96<!-- Press -->
97
98<section id="press">
99 <img class="press-img" src="{{url_for('static',
    filename='images/dango.png')}}" alt="tc-logo">
100         <img class="press-img" src="{{url_for('static',
    filename='images/IBM.png')}}" alt="tnw-logo">
101         <img class="press-img" src="{{url_for('static',
    filename='images/TCS.png')}}" alt="biz-insider- logo">
102         <img class="press-img" src="{{url_for('static',
    filename='images/wipro.png')}}" alt="mashable-logo">
103
104     </section>
105
106     <footer id="footer">
107         <i class="footer-img fa-brands fa-facebook- f"></i>
108         <i class="footer-img fa-brands fa- instagram"></i>
109         <i class="footer-img fa-brands fa-twitter"></i>
```

```
110         <i class="footer-img fa-solid fa-envelope"></i> 111
112         <p>© Copyright 2022 Mr.Perks - Job
    Recommender</p>
113     </footer>
114         <!_____________________________________________
    __Nav_____________________________________________
    _____________>
115             <!-- JavaScript Bundle with Popper -->
116             <script src="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/di
    st/js/bootstrap.bundle.min.js" integrity="sha384-
    OERcA2EqjJCMA+/3y+gxIOqMEjwtxJY7qPCqsdltbNJuaOe923+m
    o//f6V8Qbsw3" crossorigin="anonymous"></script>
117             <script src="https://kit.fontawesome.com/e66a43891e.js"
    crossorigin="anonymous"></script>
118     {% endblock %}
```

2. Login page

```
1   {% extends "bootstrap/base.html" %}
2   {% block title %}Login{% endblock %}
3   {% block styles %}
```

```
4 {{super()}}
5  <link rel="stylesheet" href="{{url_for('static', filename='style.css')}}">
6  <link
   href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/d
   ist/css/bootstrap.min.css" rel="stylesheet" integrity="sha384-
   Zenh87qX5JnK2Jl0vWa8Ck2rdkQ2Bzep5IDxbcnCeuOxjzrPF/et
   3URy9Bv1WTRi" crossorigin="anonymous">
7  {% endblock %}
8  {% block content %}
9  <div class="Login-form">
10     <section class="vh-100">
11     <div class="container-fluid h-custom">
12 <div class="row d-flexjustify-content-center align-items-center h-100">
13             <div class="col-md-9 col-lg-6 col-xl-5">
14 <img src="https://mdbcdn.b- cdn.net/img/Photos/new-
   templates/bootstrap-login- form/draw2.webp"
15                     class="img-fluid" alt="Sample image">
16             </div>
17 <div class="col-md-8 col-lg-6 col-xl-4 offset- xl-1">
18 <form class="form" method="post"
   action="{{url_for('login')}}">
19
20 <div class="divider d-flex align-items- center my-4">
21 <h4 class="text-center fw-bold mx-3 mb- 0">LOGIN</h4>
```

```
22                  </div>
23                  <div class="form-outline mb-4">
24 <input type="text" id="form3Example3" name="email" class="form-
   controlform-control-lg"
25 placeholder="Enter a valid email address" />
26 <label class="form-label" for="form3Example3">Email
   address</label>
27                  </div>
28                  <div class="form-outline mb-3">
29 <input type="password" id="form3Example4" name="password"
   class="form- control form-control-lg"
30                          placeholder="Enter password" />
31 <label class="form-label"
   for="form3Example4">Password</label>
32                  </div>
33 <div class="text-center text-lg-start mt-4 pt-2">
34 <input type="submit" class="btn btn- primary btn-lg"
35 style="padding-left: 2.5rem; padding- right: 2.5rem;">
36                  </div>
37              </form>
38              <p>New user</p>
39              <a href="{{url_for('register')}}">Signup</a>
40          </div>
41      </div>
42  </div>
43</div>
```

```
44 <script src="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/di
   st/js/bootstrap.bundle.min.js" integrity="sha384-
   OERcA2EqjJCMA+/3y+gxIOqMEjwtxJY7qPCqsdltbNJuaOe923+m
   o//f6V8Qbsw3" crossorigin="anonymous"></script>
45 <script src="https://kit.fontawesome.com/e66a43891e.js"
   crossorigin="anonymous"></script>
46{% endblock %}
```

3. signup page

```
1  {% extends "bootstrap/base.html" %}
2  {% block title %}Register{% endblock %}
3  {% block styles %} 4
{{super()}}
5  <link
   href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/d
   ist/css/bootstrap.min.css" rel="stylesheet" integrity="sha384-
   Zenh87qX5JnK2Jl0vWa8Ck2rdkQ2Bzep5IDxbcnCeuOxjzrPF/et
   3URy9Bv1WTRi" crossorigin="anonymous">
6  {% endblock %}
7  {% block content %}
8  <div id="register">
9  <section class="vh-100"style="background-color: #eee;">
10     <div class="container h-100">
11 <div class="row d-flexjustify-content-center align-items-center h-100">
```

```
12              <div class="col-lg-12 col-xl-11">
13 <div class="card text-black" style="border- radius: 25px;">
14                      <div class="card-body p-md-5">
15                          <div class="row justify-content-center">
16                              <div class="col-md-10 col-lg-6 col-xl-
   5 order-2 order-lg-1">
17
18                                  <p class="text-center h1 fw-bold mb-
   5 mx-1 mx-md-4 mt-4">Sign up</p>
19
20                                  <form class="mx-1 mx-md-4"
   action="{{url_for('register')}}" method="post">
21
22 <div class="d-flex flex-row align- items-center mb-4">
23 <i class="fas fa-user fa-lg me-3 fa-fw"></i>
24 <div class="form-outline flex- fill mb-0">
25                                          <input type="text"
   id="form3Example1c" class="form-control" name="name"
   />
26 <label class="form-label" for="form3Example1c">Your Name</label>
27                                      </div>
28                                  </div>
29
30 <div class="d-flex flex-row align- items-center mb-4">
31                                      <i class="fas fa-envelope fa-lg
```

```
me-3 fa-fw"></i>
                                    <div class="form-outline flex-
32
fill mb-0">
33                                      <input type="text"
id="form3Example3c" class="form-control" name="email" />
34 <label class="form-label" for="form3Example3c">Your Email</label>
35                                  </div>
36                                </div>
37
38 <div class="d-flex flex-row align- items-center mb-4">
39 <i class="fas fa-lock fa-lg me-3 fa-fw"></i>
40 <div class="form-outline flex- fill mb-0">
41 <input type="password" id="form3Example4c" class="form-
control" name="password"/>
42                                      <label class="form-label"
for="form3Example4c">Password</label>
43                                  </div>
44                                </div>
45
46                                <div class="d-flex flex-row align- mb-4">
items-center fa-                    <i class="fas fa-key fa-lg me-3
47
fw"></i>                            <div class="form-outline flex-
48
fill mb-0">
49                                      <input type="password"
```

```
    id="form3Example4cd" class="form-control" name="repeatpassword" />
50  <label class="form-label" for="form3Example4cd">Repeat your
    password</label>
51                                      </div>
52                                  </div>
53
54  <div class="form-check d-flex justify-content-center mb-5">
55  <input class="form-check-input me-2" type="checkbox" value=""
    id="form2Example3c"
    />
56  <label class="form-check-label" for="form2Example3">
57  I agree all statements in <a href="#!">Terms of service</a>
58                                      </label>
59                                  </div>
60
61  <div class="d-flex justify- content-center mx-4 mb-3 mb-lg-4">
62  <input type="submit" class="btn btn-primary btn-lg">
63                                  </div>
64
65                              </form>
66
67                          </div>
68                          <div class="col-md-10 col-lg-6 col-xl-
    7 d-flex align-items-center order-1 order-lg-2">
69
70                              <img src="https://mdbcdn.b-
```

```
    cdn.net/img/Photos/new-templates/bootstrap-
    registration/draw1.webp"
71                                  class="img-fluid" alt="Sample image">
72
73                              </div>
74                          </div>
75                      </div>
76                  </div>
77              </div>
78          </div>
79      </div>
80</section>
81</div>
82 <script src="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/di
    st/js/bootstrap.bundle.min.js" integrity="sha384-
    OERcA2EqjJCMA+/3y+gxIOqMEjwtxJY7qPCqsdltbNJuaOe923+m
    o//f6V8Qbsw3" crossorigin="anonymous"></script>
83 <script src="https://kit.fontawesome.com/e66a43891e.js"
    crossorigin="anonymous"></script>
84{% endblock %}
85
86
```

4. job list page

```
1  {% extends "bootstrap/base.html" %}
2  {% block title %}Home - Skills / JobsRecommender{% endblock %}
```

```
3 {% block styles %} 4
{{super()}}
5   <link rel="stylesheet" href="{{url_for('static', filename='style.css')}}">
6   <link
    href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/d
    ist/css/bootstrap.min.css" rel="stylesheet" integrity="sha384-
    Zenh87qX5JnK2Jl0vWa8Ck2rdkQ2Bzep5IDxbcnCeuOxjzrPF/et
    3URy9Bv1WTRi" crossorigin="anonymous">
7   {% endblock %}
8   {% block content %}
9   <div>
10 <img width="100%" class="d-block w-100" src="{{url_for('static',
    filename='images/1.png')}}"alt="First slide">
11</div>
12<nav class="navbar navbar-light bg-light">
13 <form class="form-inline" action="{{url_for('joblist')}}"
    method="POST">
14 <input id="search-bar" class="form-control mr- sm-2" type="search"
    name = 'search-bar' placeholder="Search jobs" aria-label="Search">
15 <button class="btn btn-outline-success my-2 my- sm-0"
    type="submit">Search</button>
16     </form>
17</nav>
18<div class="jobs-box">
19          <div class="row">
20                  {% for i in range(0,len)%}
21                    <div class="col-lg-3 col-md-3 col-sm-1">
```

```
22                      <div class="card" style="width: 40rem;">
23 <img class="card-img-top" src="{{url_for('static',
   filename='images/jobs.png')}}" alt="Card imagecap">
24                          <div class="card-body">
25 <h5 class="card- title">{{jtr[i]}}</h5>
26                          <p class="card-text">{{jdr[i]}}</p>
27                              <form
   action="{{url_for('applyjob')}}" method="post">
28 <label>Company Name<input name="cnp" type="text" readonly
   class="form-control- plaintext" id="staticEmail"value={{cn[i]}}></label>
29                                  <input class="btn btn-
   success btn-lg" type="submit" value="Apply">
30                              </form>
31                      </div>
32                      </div>
33                  </div>
34                {% endfor %}
35          </div>
36</div>
37<script>
38     window.watsonAssistantChatOptions = {
39          integrationID: "795fc7c7-311e-446c-945f- 0acaffce5460", //
   The ID of thisintegration.
40 region: "jp-tok", // The region yourintegration is hosted in.
41 serviceInstanceID: "403b880a-1907-4cd4-be34- ed7621ce872c", // The ID
   of your serviceinstance.
42          onLoad: function(instance) { instance.render();
```

```
    }
43      };
44      setTimeout(function(){
45          const t=document.createElement('script');
46 t.src="https://web- chat.global.assistant.watson.appdomain.cloud/version
    s/" + (window.watsonAssistantChatOptions.clientVersion || 'latest') +
    "/WatsonAssistantChatEntry.js";
47      document.head.appendChild(t); 48          });
49</script>
50 <script src="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/di
    st/js/bootstrap.bundle.min.js" integrity="sha384-
    OERcA2EqjJCMA+/3y+gxIOqMEjwtxJY7qPCqsdltbNJuaOe923+m
    o//f6V8Qbsw3" crossorigin="anonymous"></script>
51 <script src="https://kit.fontawesome.com/e66a43891e.js"
    crossorigin="anonymous"></script>
52{% endblock %}
```

5. corporate login page

```
1   {% extends "bootstrap/base.html" %}
2   {% block title %}Login{% endblock %}
3   {% block styles %} 4
{{super()}}
5   <link rel="stylesheet"href="{{url_for('static', filename='style.css')}}">
6   <link
```

```
    href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/d
    ist/css/bootstrap.min.css" rel="stylesheet" integrity="sha384-
    Zenh87qX5JnK2Jl0vWa8Ck2rdkQ2Bzep5IDxbcnCeuOxjzrPF/et
    3URy9Bv1WTRi" crossorigin="anonymous">
7   {% endblock %}
8   {% block content %}
9   <div class="Login-form">
10      <section class="vh-100">
11      <div class="container-fluid h-custom">
12  <div class="row d-flexjustify-content-center align-items-center h-100">
13              <div class="col-md-9 col-lg-6 col-xl-5">
14  <img src="{{url_for('static',
    filename='images/corp.png')}}"
15                      class="img-fluid" alt="Sample image">
16              </div>
17  <div class="col-md-8 col-lg-6 col-xl-4 offset- xl-1">
18  <form class="form" method="post"
    action="{{url_for('corporate_login')}}">
19
20  <div class="divider d-flex align-items- center my-4">
21  <h4 class="text-center fw-bold mx-3 mb- 0">CORPORATE LOGIN</h4>
22                      </div>
23                      <div class="form-outline mb-4">
24  <input type="text" id="form3Example3" name="email" class="form-
    controlform-control-lg"
25                              placeholder="Enter a valid email
```

```
address" />
26 <label class="form-label" for="form3Example3">Email
address</label>
27                     </div>
28                     <div class="form-outline mb-3">
29 <input type="password" id="form3Example4" name="password"
class="form- control form-control-lg"
30                                 placeholder="Enter password" />
31 <label class="form-label"
for="form3Example4">Password</label>
32                     </div>
33 <div class="text-center text-lg-start mt-4 pt-2">
34 <input type="submit" class="btn btn- primary btn-lg"
35 style="padding-left: 2.5rem; padding- right: 2.5rem;">
36                     </div>
37                 </form>
38             </div>
39         </div>
40     </div>
41</div>
42 <script src="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/di
st/js/bootstrap.bundle.min.js" integrity="sha384-
OERcA2EqjJCMA+/3y+gxIOqMEjwtxJY7qPCqsdltbNJuaOe923+m
o//f6V8Qbsw3" crossorigin="anonymous"></script>
43 <script src="https://kit.fontawesome.com/e66a43891e.js"
```

```
    crossorigin="anonymous"></script>
44{% endblock %}
```

8. TEST CASES

TestcaseID	FeatureType	Component	TestScenario
LoginPage_TC_OO1	Functional	HomePage	Verifyuser is able to see theLogin/Signup popup when userclickedonMy accountbutton
LoginPage_TC_OO2	UI	HomePage	Verify the UI elements inLogin/Signuppop up
LoginPage_TC_OO3	Functional	Home page	Verify user is able to log intoapplicationwithValidcredenti als
LoginPage_TC_OO4	Functional	Loginpage	Verify user is able to log intoapplicationwithInValidcredenti also
LoginPage_TC_OO5	Functional	Loginpage	Verify user is able to log intoapplicationwithInValidcredenti als

ExpectedResult	ActualResult	Status	Commnets
Login/Signuppopup shoulddisplay	Working asexpected	pass	
Application should show below UIelements: a.email text boxb.passwordtext box c.Login button with orange colourd.New customer? Create account linke.Last passw	Working asexpected	pass	
User should navigate to user accounthomepage	Working asexpected	pass	
Application should show 'Incorrectemail or password ' validationmessage.	Working asexpected	pass	
Application should show 'Incorrectemail or password ' validationmessage.	Working asexpected	pass	
Application should show 'Incorrectemail or password ' validationmessage.	Working asexpected	pass	

8.2.USER ACCEPTANCE TESTING:

PurposeofDocument:

Thepurposeofthisdocumentistobrieflyexplainthetestcoverageandopenissue softhe[ProductName]projectatthetimeofthereleasetoUserAcceptanceTesti ng (UAT).

DefectAnalysis:

Thisreportshowsthenumberofresolvedor closedbugsateachseverity level,andhowthey wereresolved.

Resolution	Severity1	Severity2	Severity3	Severity4	Subtotal
ByDesign	10	4	2	3	20
Duplicate	1	0	3	0	4
External	2	3	0	1	6
Fixed	11	2	4	20	37
NotReproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won'tFix	0	5	2	1	8
Totals	24	14	13	26	77

TestCaseAnalysis:

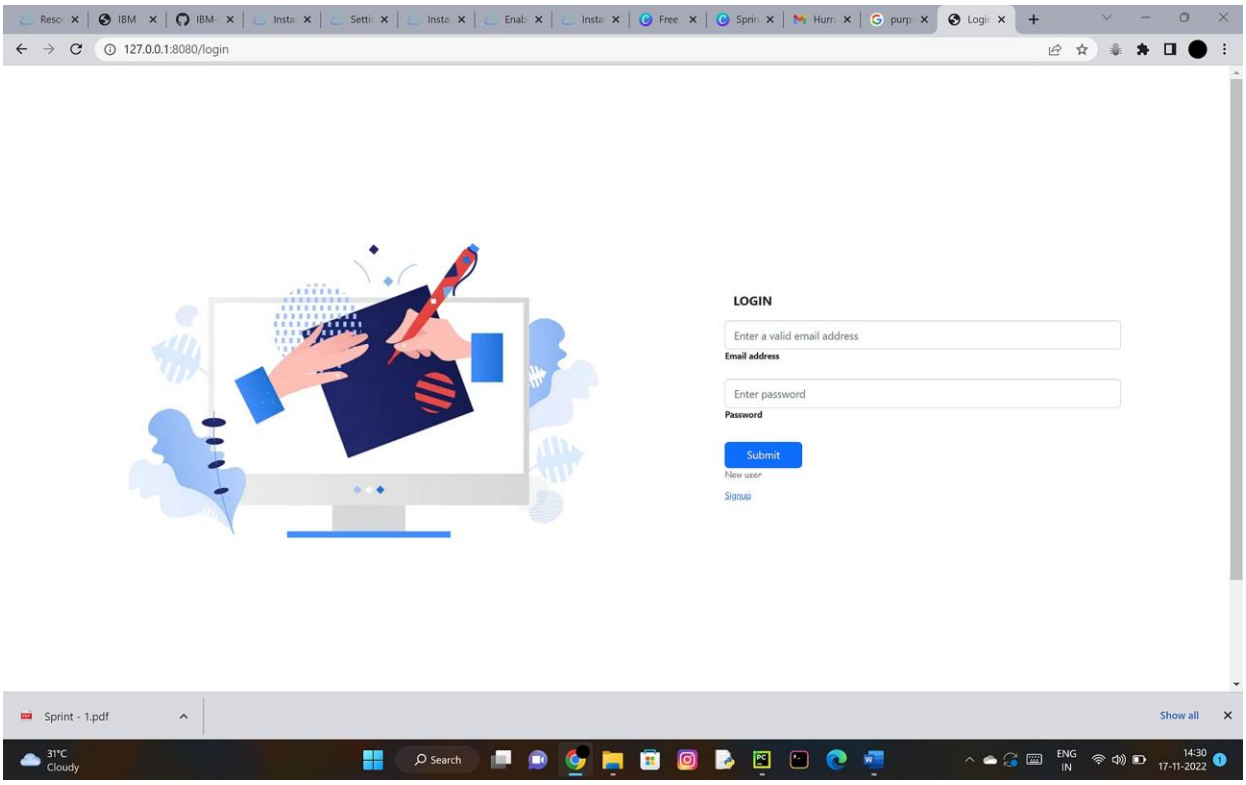
Thisreportshowsthenumberoftestcasesthathavepassed,failed,anduntested

Section	TotalCases	NotTested	Fail	Pass
PrintEngine	7	0	0	7
ClientApplication	51	0	0	51
Security	2	0	0	2
OutsourceShipping	3	0	0	3
ExceptionReporting	9	0	0	9
FinalReportOutput	4	0	0	4
VersionControl	2	0	0	2

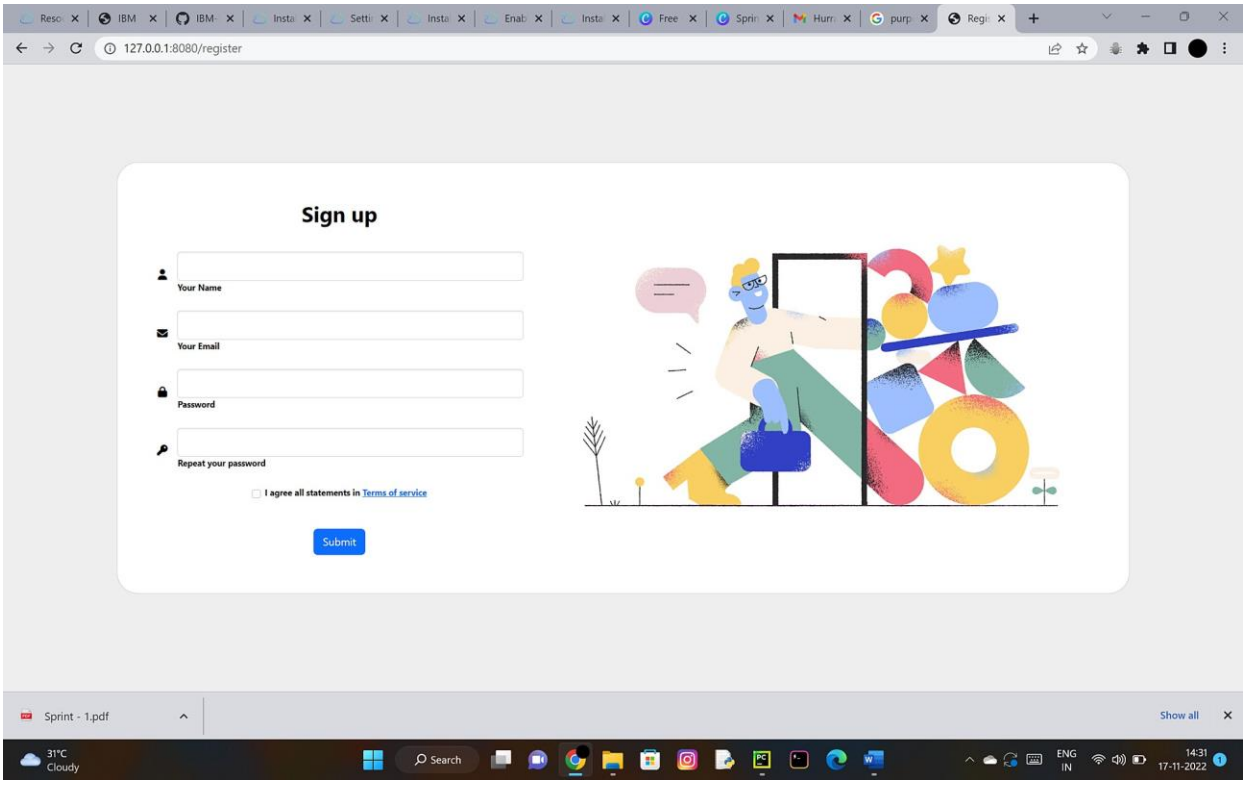
9 . RESULTS

9.1 HOMEPAGE

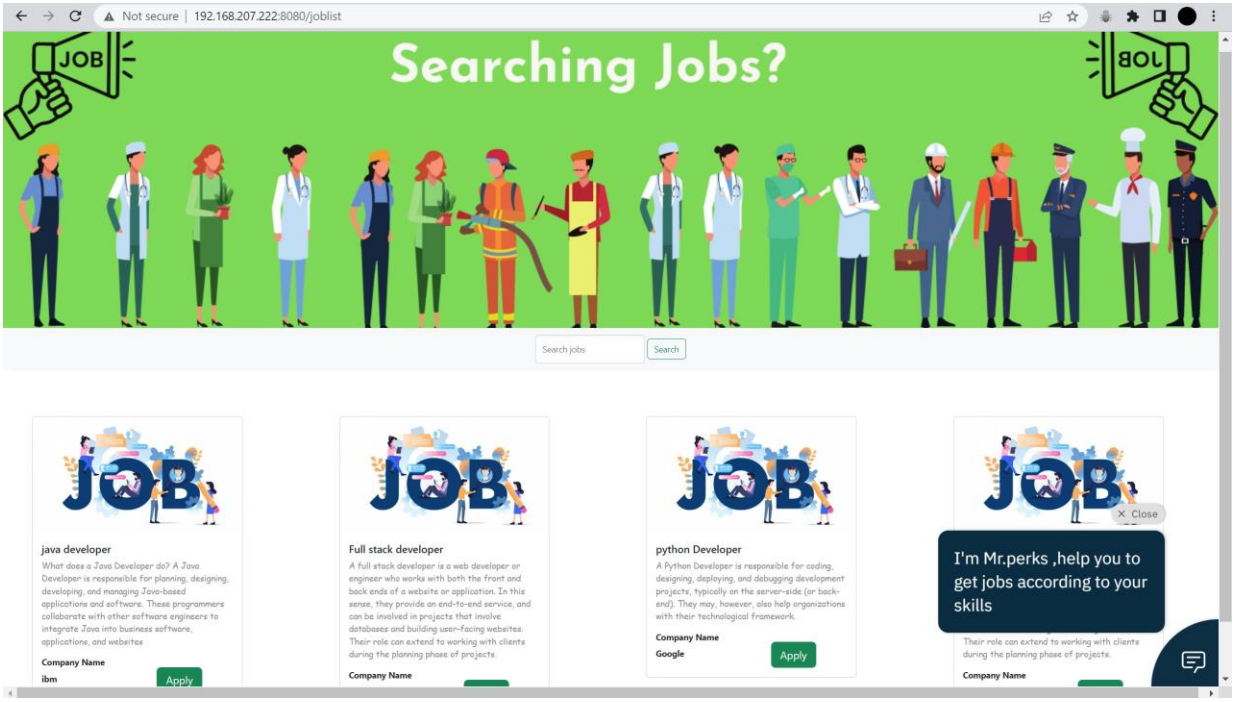
9.2 LOGIN


127.0.0.1:8080/login
LOGIN
Enter a valid email address
Email address
Enter password
Password
Submit
New user
Signup
Sprint - 1.pdf
Show all
31°C
Cloudy
Search
ENG
IN
14:30
17-11-2022

9.3 SIGNUP


127.0.0.1:8080/register
Sign up
Your Name
Your Email
Password
Repeat your password
I agree all statements in Terms of service
Submit
Sprint - 1.pdf
Show all
31°C
Cloudy
Search
ENG
IN
14:31
17-11-2022

9.4 JOB LIST



9.5 CORPORATE LOGIN

10. CONCLUSION

Job Recommendation System has a major role to play among recommending systems. With the presence of new algorithms and techniques, the system needs to evolve along with it. The main objective of this project is to recommend a suitable job for the candidates. This project has two pre-processing methods, one text mining method and one similarity function. The pre-processing methods are stop words and porter stemmer. The text mining method is tf-idf. The similarity function is a cosine similarity function. Pre-processing methods are used with resumes and with jobs description, to make the system more efficient by avoiding some garbage words. Tf-idif is used in processed resumes and processed jobs descriptions to convert it from text to matrix to compare. Cosine Similarity will measure the similarity between the resume and each job description. Finally, it will display the scores for the jobs in a sorted way. There is also a pie chart which is used to visualize the percentage of the scores which is got by the candidate for the jobs. Then use a list compare 59 method to compare the resume and job skills to recommend the skills to be improved by the candidate.

GITHUB LINK :

https://github.com/IBM-EPBL/IBM-Project-47644-1660800728

DEMO VIDEO LINK :
https://www.youtube.com/watch?v=vKrVVFgbaXo