SKILL / JOB RECOMMENDER APPLICATION

PROJECT REPORT

TEAM ID - PNT2022TMID52437

Abstract

The rise of digital communication and the spread of the internet has made an enormous impact in every industry. One such domain is the Hiring process, where a job seeker applies to a job by creating a profile on a job portal by providing all his/her work preferences. These work preferences of each user can be collected from each user and provide job recommendations based on their preference. Data acquired for our study has no previous interaction between the user data and Job listing data. With such a dataset, we have addressed the issue of cold start from both User and Job perspective. There had been work done in this field, where researchers have implemented Recsys using the Hybrid filtering method as user data had previous interaction with item (Rafter et al., 2000).In this dissertation, we have approached the problem with the three-tier approach design. Also, recommend the top-n job to the user by analyzing and measuring similarity between the user preference and explicit features of job listing using Content-based filtering, which is devised in support of natural language processing and cosine similarity.

1.Introduction:

When the whole world is coming back on its feet, those businesses affected by this pandemic disease slowly tries to gain back the momentum it lost. Now is the time when the companies or businesses seek to invest in human resources, which would help them to gain the momentum it lost during this period. . When the governments across the world ask businesses to halt the operation in the effort of controlling the pandemic, many companies asked their employees to work remotely. In contrast, many other companies started to reduce their operational cost by terminating employees who were in permanent and contract roles. Individuals who lost their job to the consequence of shutdown are awaiting for their next opportunity. . Naturally, we human tries to strive through all difficulties to serve the purpose of our life. A daily job provides a sense of purpose to an individual(stillman, 2019), and he tries to get better at it, which results in leaving current employment and looking for a new one; this is a constant cycle of the hiring process.

To serve the constant cycle of the hiring process in the job applicant's perspective, many job companies have come up with solutions for providing the job board. Here a seeker looks up for the job he would find relevant to him and apply for it. As there are many job boards, applicants tend to use the tool that provides better services to them, services such as writing a CV, creating a job profile, and recommending new jobs to a job seeker. Job applicants have become more persistent and proactive in searching for new opportunities that fit their skills. However, companies that are targeting these job seekers are finding it challenging to identify the job seeker's skill and provide personalized job recommendations.

2. Literature Survey:

2.1 Existing Problem:

The dataset used for this research are sourced from Stack overflow survey data which is modeled as the user data for this research. The research question proposed by this research is "Can an efficient recommender system be modeled for the Job seekers which recommend Jobs with the user's skill set and job domain and also addresses the issue of cold start?". To answer the research question, below are the objectives that need to be satisfied with going forward .

2.2 Existing solution:

The results of job recommender system which are run in the python environment are presented. Recommender system is provided with the profile vector of user and item to generate a set of item as a recommendation to user in question. Profile vector of a user holds the information regarding the preferences of user on IT skill and domain specific information. Where as, profile vector of item holds the information regarding the skills and job domain that is required for that job. Also as defined in section 1.4, the purpose of this research was not only model a job recommender system using user's skill set and Job domain but also to address issue of cold start. To complete the research, we had set ourselves a objectives which ease our way in completion of the research. As to conduct the research, the need for two different dataset, which will be used create a user vector and item vector was required. For the purpose of user data we had choose the data from stack overflow survey; Without the Job data set, we wouldn't be able to continue this research. So, In this study, the task of web scraping was performed on several techniques and finally opted to continue the study by scraping data using R programming in R-studio environment.

If a user makes a changes in a profile, it would affect the profile vector and recommends the job that are similar to profile vector. The new recommendations are made to the user, when new jobs are added top the data layer, the job vector gains high similarity score.
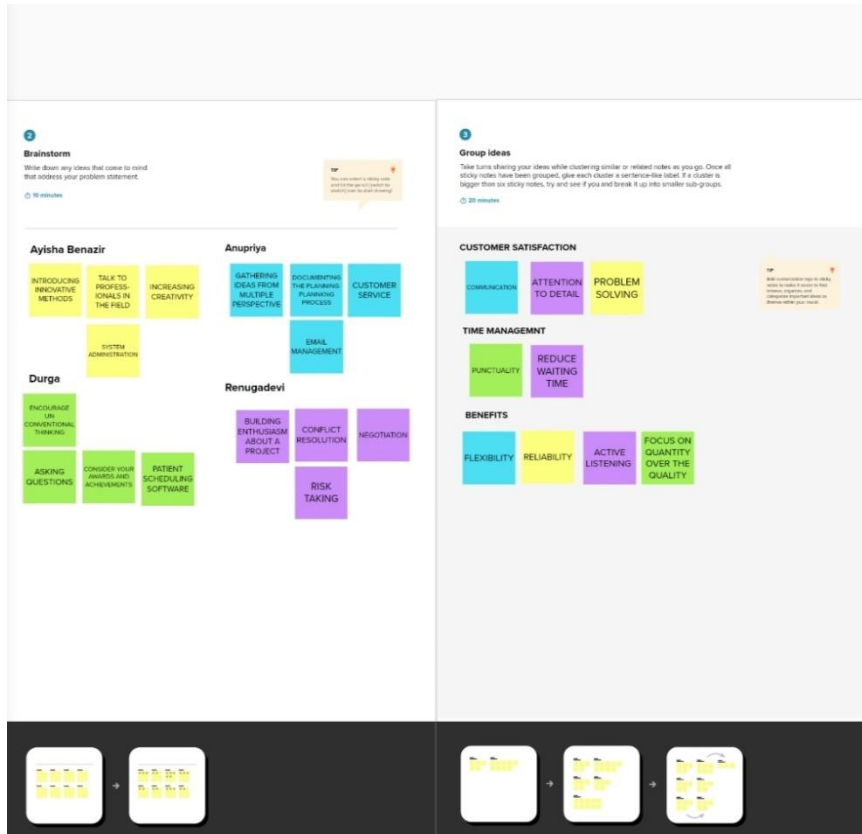
3. IDEATION & PROPOSED SOLUTION:
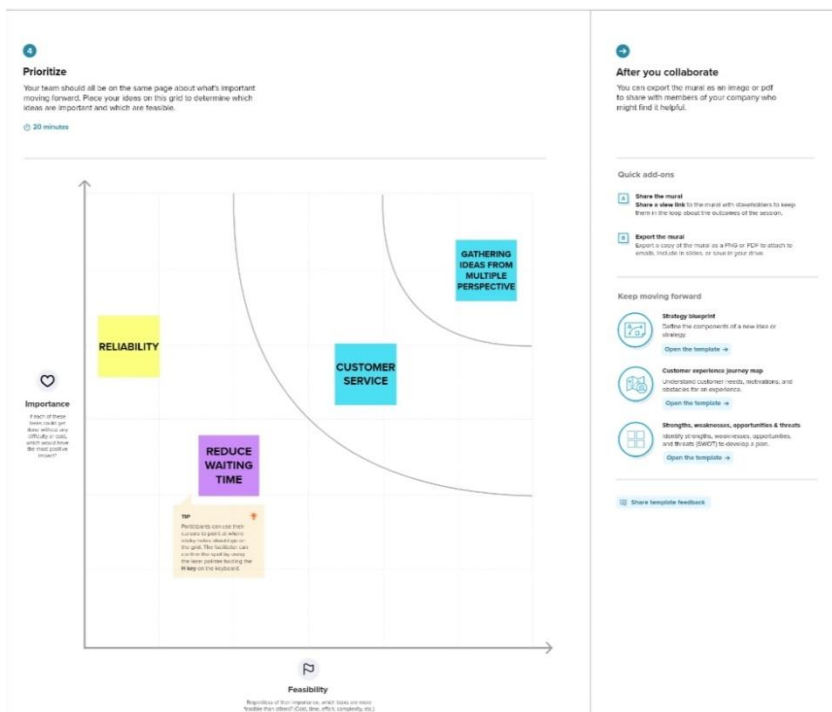
3.1 Empathy Map Canvas:

- ➢ An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes.
- ➢ It is a useful tool to helps teams better understand their users.
- ➢ Creating an effective solution requires understanding the true problem and the person who is experiencing it.
- ➢ The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges

3.2 Ideation & Brainstorming:

Brainstorm & Idea Prioritization Template:

Step-1: Team Gathering, Collaboration and Select the Problem Statement

Step-2: Brainstorm, Idea Listing and Grouping

Step-3: Idea Prioritization

3.3 Proposed Solution:

Proposed Solution Template:

Project team shall fill the following information in proposed solution template.

| S. No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	➢ We are giving opportunity to job Seekers. ➢ User can access large number of data.
2. s	Idea / Solution description	➢ To focuses on fit for feature. ➢ To provide user what company expect.
3.	Novelty / Uniqueness	➢ We provide high Data Security. ➢ We provide both the mobile and computer platforms.
4.	Social Impact / Customer Satisfaction	➢ At last, we believe that two people with equal talent should have equal access to opportunity and we're committed to making this vision reality through our project. ➢ We are providing Friendly approach and employability
5.	Business Model (Revenue Model)	➢ We are connecting you with other professionals also with companies and recruiters. Along with professionals, it also serves companies and even charges for providing certain premium services.
6.	Scalability of the Solution	➢ Scalability is a custom training and organizational development firm dedicated to helping businesses scale

3.4 Problem solution fit:
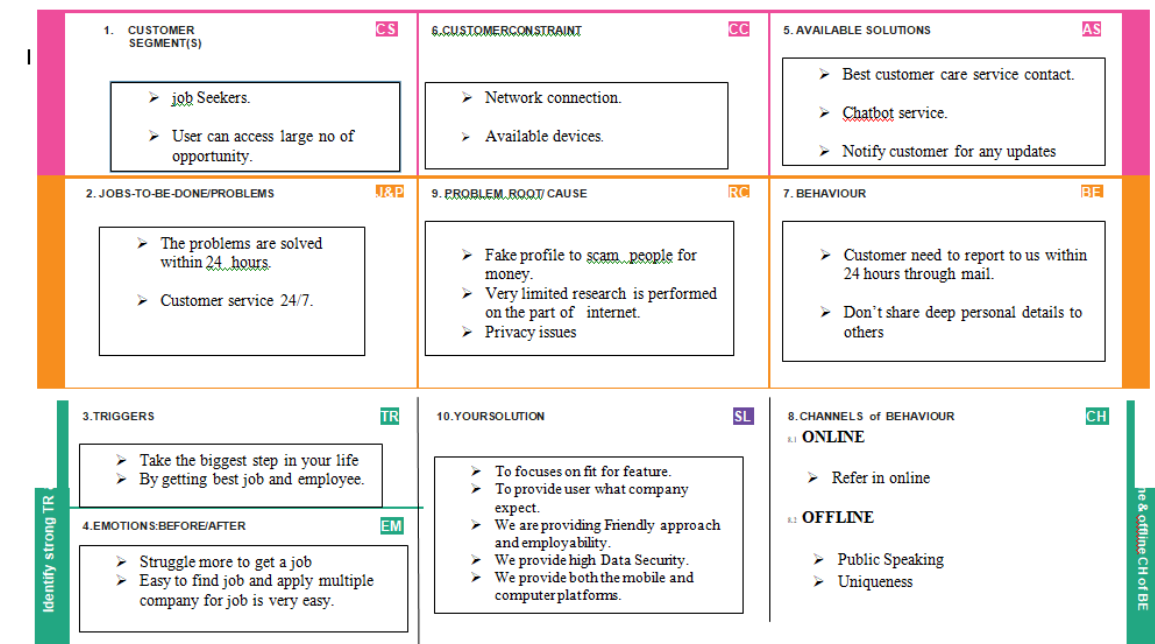
4. PROJECT DESIGN:

4.1 Data Flow Diagram:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.
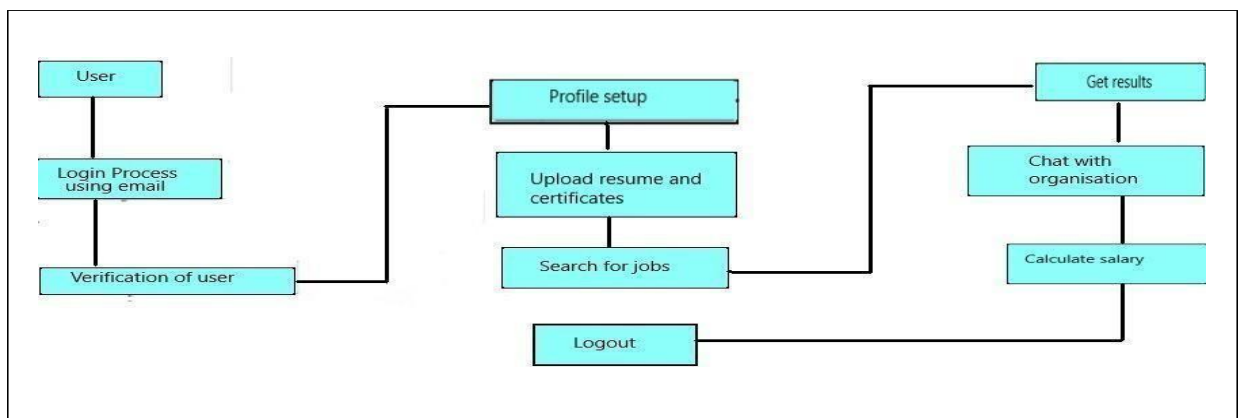
4.2 User Stories:

User type	Functional Requoirement (Epic)	User Story Number	User Story/Task	Acceptance Criteria	Priority	Release	
Customer (mobile user)	Regitration	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 a 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.		Medium	Sprint-1	
	Login	USN 5	As a user, I can log into the application by entering email & password.		High	Sprint-1	
	Dashboard	USN 6	I can access my dashboard after signing in.	I can access my account /dashboard	High	Sprint-1	
Customer (web user)	Access	USN 7	As a user, I can setup a profile, and basic details by signing in.		Medium	Sprint-1	
		USN 8	As a user, I will upload my resume, certificates, and other requirements.	I can perform sever a task In the application		Sprint-1	
Customer Care Executive	Chatbot	USN 9	As a user, I can seek guidance from the customer care executive.		High	Sprint-1	
Administrator	DBMS	USN 10	As an administrator, I can keep the applications your organization relies on running.	I can perform various modifications in the applications.	High	Sprint-1	

4.3 Solution Architecture:

Solution architecture is a complex process – with many sub-processes – that bridges the between business problems and technology solutions. Its goals are to: Find the best tech solution to solve existing business problems.

● Describe the structure, characteristics, behavior and other aspects of the software to project stakeholders.

● Define features, development phases and solution requirements.

● Provide specifications according to which the solution is defined, managed and delivered.

Solution Architecture:
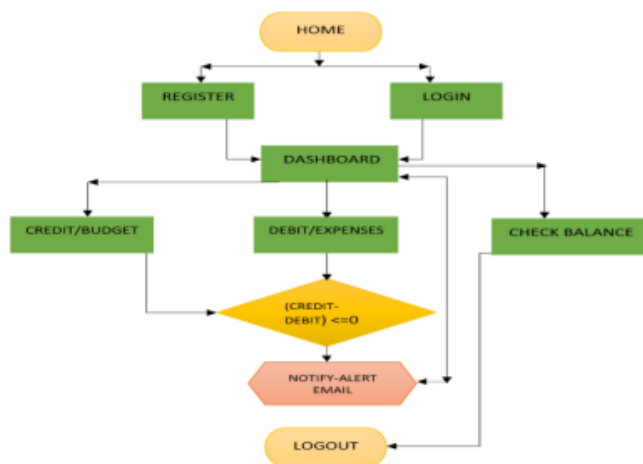
4.4 Technical Architecture:

Deliverables shall include the architectural diagram as below and the information as per the table 1 & table 2.
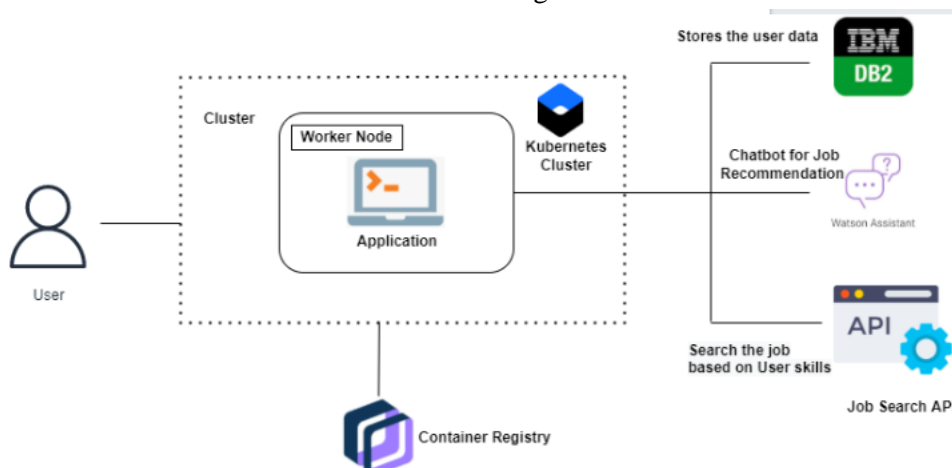
Table-1: Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	The user can interacts with our application with the Help of chat bot,etc.	HTML, CSS, JavaScript / Angular Js / React Js etc.
2.	Application Logic-1	The User can login with application by previously He should register in our web app.	Javascript
3.	Application Logic-2	They can also register with the help of a chatbot.	IBM WatsonAssistant
4.	Cloud Database	The user data will bestored and retrieved with the Help of this. database.	IBM DB2,IBM Cloudant etc.
5.	File Storage	The user documents like photos, resumes and Much more will bestored in cloud bucket,etc.,	IBM Block Storage or Other Storage Service or Local File system
6.	External API	With the help of API, the user can search the job Based on their Skil lset.	IBM API, etc.
7.	Infrastructure (Server/Cloud)	Application Deployment on Local System Cloud	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description
1.	Is it Scalable?	It follows highly scalable technologies that allows application to handle increase in large user data's workload and performan y operation without any problem.
2.	Is it Modifiable?	It is highly Modifiable and Maintenance requires low cost, compared to other applications.
3.	Is the System Robust?	It does not disturb the performance of the computer by not affecting the operating system. It works in minimal hardware systems.

5. PROJECT PLANNING & SCHEDULING:

5.1 Sprint Planning & Estimation:

SPRINT 1 & SPRINT 2

app.py:

from flask import Flask, render_template, request, redirect, url_for, session

import ibm_db

import re

app = Flask(__name__)

app.secret_key = 'a'

```python
conn=ibm_db.connect("DATABASE=bludb;HOSTNAME=9938aec0-8105-433e-8bf9-
0fbb7e483086.clogj3sd0tgtu0lqde00.datbases.appdomain.cloud;PORt=32459;SECURITY=SSl;SSLServerCerti
ficate=DigiCertGlobalRoot.crt;UID=mcl23949;PWD=dmUiv2o6zjDMw0Ea",)

@app.route('/')

def homer():

    return render_template('home.html')


@app.route('/login',methods =['GET', 'POST'])

def login():

    global userid

    msg = ''

    if request.method == 'POST' :

        username = request.form['username']

        password = request.form['password']

        sql = "SELECT * FROM users WHERE username =? AND password=?"

        stmt = ibm_db.prepare(conn, sql)

        ibm_db.bind_param(stmt,1,username)

        ibm_db.bind_param(stmt,2,password)

        ibm_db.execute(stmt)

        account = ibm_db.fetch_assoc(stmt)

        print (account)

        if account:

            session['loggedin'] = True

            session['id'] = account['USERNAME']

            userid=  account['USERNAME']

            session['username'] = account['USERNAME']

            msg = 'Logged in successfully !'

            msg = 'Logged in successfully !'

            return render_template('dashboard.html', msg = msg)

        else:

            msg = 'Incorrect username / password !'
```

```python
        return render_template('login.html', msg = msg)

@app.route('/register', methods =['GET', 'POST'])

def register():

    msg = ''

    if request.method == 'POST' :

        username = request.form['username']

        email = request.form['email']

        password = request.form['password']

        sql = "SELECT * FROM users WHERE username =?"

        stmt = ibm_db.prepare(conn, sql)

        ibm_db.bind_param(stmt,1,username)

        ibm_db.execute(stmt)

        account = ibm_db.fetch_assoc(stmt)

        print(account)

        if account:

            msg = 'Account already exists !'

        elif not re.match(r'[^@]+@[^@]+\.[^@]+', email):

            msg = 'Invalid email address !'

        elif not re.match(r'[A-Za-z0-9]+', username):

            msg = 'name must contain only characters and numbers !'

        else:

            insert_sql = "INSERT INTO  users VALUES (?, ?, ?)"

            prep_stmt = ibm_db.prepare(conn, insert_sql)

            ibm_db.bind_param(prep_stmt, 1, username)

            ibm_db.bind_param(prep_stmt, 2, email)

            ibm_db.bind_param(prep_stmt, 3, password)

            ibm_db.execute(prep_stmt)

            msg = 'You have successfully registered !'

    elif request.method == 'POST':

        msg = 'Please fill out the form !'
```

```python
    return render_template('register.html', msg = msg)


@app.route('/dashboard')

def dash():


    return render_template('dashboard.html')


@app.route('/apply',methods =['GET', 'POST'])

def apply():

    msg = ''

    if request.method == 'POST' :

        username = request.form['username']

        email = request.form['email']


        qualification= request.form['qualification']

        skills = request.form['skills']

        jobs = request.form['s']

        sql = "SELECT * FROM users WHERE username =?"

        stmt = ibm_db.prepare(conn, sql)

        ibm_db.bind_param(stmt,1,username)

        ibm_db.execute(stmt)

        account = ibm_db.fetch_assoc(stmt)

        print(account)

        if account:

            msg = 'there is only 1 job position! for you'

            return render_template('apply.html', msg = msg)



        insert_sql = "INSERT INTO  job VALUES (?, ?, ?, ?, ?)"
```

```python
        prep_stmt = ibm_db.prepare(conn, insert_sql)

        ibm_db.bind_param(prep_stmt, 1, username)

        ibm_db.bind_param(prep_stmt, 2, email)

        ibm_db.bind_param(prep_stmt, 3, qualification)

        ibm_db.bind_param(prep_stmt, 4, skills)

        ibm_db.bind_param(prep_stmt, 5, jobs)

        ibm_db.execute(prep_stmt)

        msg = 'You have successfully applied for job !'

        session['loggedin'] = True

        TEXT = "Hello,a new application for job position" +jobs+"is requested"

        elif request.method == 'POST':

        msg = 'Please fill out the form !'

    return render_template('apply.html', msg = msg)


@app.route('/display')

def display():

    print(session["username"],session['id'])

    cursor = mysql.connection.cursor()

    cursor.execute('SELECT * FROM job WHERE userid = % s', (session['id'],))

    account = cursor.fetchone()

    print("accountdislay",account)

    return render_template('display.html',account = account)


@app.route('/logout')

def logout():

    session.pop('loggedin', None)

    session.pop('id', None)

    session.pop('username', None)

    return render_template('home.html')

if __name__ == '__main__':
```

```
app.run(host='0.0.0.0')
```

home.html:

```html
<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <title>JOBPORTAL | HOME</title>

    <meta charset="UTF-8">

        <!-- favicon -->

        <!-- <link rel="shortcut icon" href="/assets/img/favicon.ico" type="image/x-icon"> -->

        <!-- <link rel="icon" href="/assets/img/favicon.ico" type="image/x-icon"> -->

        <link rel="icon" type="image/png" sizes="16x16" href="/assets/img/favicon-32x32.png">

        <!-- bootstrap css cdn -->

        <link rel="stylesheet" href="https://stackpath.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css" integrity="sha384-JcKb8q3iqJ61gNV9KGb8thSsNjpSL0n8PARn9HuZOnIxN0hoP+VmmDGMN5t9UJ0Z" crossorigin="anonymous">

        <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/4.7.0/css/font-awesome.css">

        <!-- css stylesheet -->

        <link rel="stylesheet" href="css/style.css">

        <!-- font styles cdn -->

        <link rel="preconnect" href="https://fonts.gstatic.com">

        <link href="https://fonts.googleapis.com/css2?family=Alegreya&display=swap" rel="stylesheet">

        <link href="https://fonts.googleapis.com/css2?family=Alegreya:wght@600&display=swap" rel="stylesheet">

</head>

<body style="background-color:powderblue;">


        <!-- bootstrap navbar -->
```

```html
<nav class="navbar sticky-top navbar-expand-lg navbar-dark">

    <div class="container-fluid">

      <a class="main-logo-img mt-3" href="#"><img src="/static/img/smartinternz.png" alt="sheep-logo" height="50px" width="180px">

        <!-- <a class="navbar-brand" href="index.html">JobPortal</a> -->

      </a>


      <div class="row donate-sponsor">

        <a type="button" class="btn btn-success mr-1" id="donate" href="login">LOGIN</a>

        <a type="button" class="btn btn-warning mr-1" id="sponsor" href="register">REGISTER</a>

        <a type="button" class="btn btn-primary mr-1" id="sponsor" href="contact.html">CONTACT US</a>

      </div>

    </div>

  </nav>

  <!-- navbar ends -->


  <!-- what we focus on -->
  <section class="our-focus">

    <div class="container">

     <h2 class="text-center mt-3">Aboutus</h2>

     <div class="row ml-3 mt-3">

      <div class="col-lg-3 mr-5" id="focus-first">

        <div class="card" style="width: 19rem;">

          <!-- <img src="assets/img/home kids.jpg" class="card-img-top" alt="..."> -->

          <div class="card-body">

            <h5 class="card-title">Mission</h5>

            <p class="card-text">SMARTBRIDGE is an edTech organization with a vision to bridge the gap between academia & industry. Our outcome-based experiential learning programs on emerging technologies (Internet of Things, Machine Learning, Data Science, Artificial Intelligence, Robotics) are building skilled entry - level engineers, for the corporate world. .

            </p>

          </div>
```

```
          </div>

        </div>

        <div class="col-lg-3 mr-5" id="focus-second">

          <div class="card" style="width: 20rem;">

            <!-- <img src="assets/img/friendship day.JPG" class="card-img-top" alt="..."> -->

            <div class="card-body">

              <h5 class="card-title">Vission</h5>

                <p class="card-text">Our main objective is to bridge the existing gaps between prevailing
```
industry standards and what the academics offer to the graduates while passing out of university. SmartBridge
offers suitable skill deployment and training to the young talent before on boarding their first job.

Our skill development programs are designed considering the present expectations in the industry. </p>
```
            </div>

          </div>

        </div>

        <div class="col-lg-3 ml-5" id="focus-third">

          <div class="card" style="width: 20rem;">

            <!-- <img src="assets/img/health camp.jpg" class="card-img-top" alt="..."> -->

            <div class="card-body">

              <h5 class="card-title">Objective</h5>

              <p class="card-text">Well directed career guidance programs for educational institutions
```
Appropriate certification courses that suit the industry need

Train the trainers; expanded awareness about the current industry standards

Liaise with corporates to offer niche internships

Establish technology development centers in colleges

Specialised incubation centers in collaboration with corporates</p>
```
            </div>

          </div>

        </div>

      </div>

    </div>
```

```html
    </section>
  <!-- focus section ends -->


<!-- footer starts -->
  <!-- Site footer -->
  <footer class="site-footer">
    <div class="container mt-5">
      <div class="row">
        <div class="col-sm-12 col-md-6">
          <h3>JobPortal</h3>
          <p class="text-justify">Lorem ipsum dolor sit amet consectetur adipisicing elit.
            Voluptatum quis, reiciendis id magni magnam, accusamus nobis in,
            temporibus molestias ab placeat rerum aperiam illum perspiciatis
            ducimus non! Fugiat, odit ducimus.</p>
        </div>


        <div class="col-xs-6 col-md-3">
          <h4>Get in Touch</h4>
          <ul class="footer-links">
            <li><a href="mailto:test@gmail.com">jobportal@gmail.com</a></li>
            <li><a href="">+91 8977787657</a></li>
          </ul>
        </div>



      </div>
    <hr>



    </div>
```

</div>

      </footer>

        </body>

</html>

Login.html:

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <title>JOBPORTAL | LOGIN</title>

      <!-- favicon -->

      <!-- <link rel="shortcut icon" href="/assets/img/favicon.ico" type="image/x-icon"> -->

      <!-- <link rel="icon" href="/assets/img/favicon.ico" type="image/x-icon"> -->

      <link rel="icon" type="image/png" sizes="16x16" href="/assets/img/favicon-32x32.png">

      <!-- bootstrap css cdn -->

      <link rel="stylesheet" href="https://stackpath.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css" integrity="sha384-JcKb8q3iqJ61gNV9KGb8thSsNjpSL0n8PARn9HuZOnIxN0hoP+VmmDGMN5t9UJ0Z" crossorigin="anonymous">

      <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/4.7.0/css/font-awesome.css">

      <!-- css stylesheet -->

      <link rel="stylesheet" href="css/style.css">

      <!-- font styles cdn -->

      <link rel="preconnect" href="https://fonts.gstatic.com">

      <link href="https://fonts.googleapis.com/css2?family=Alegreya&display=swap" rel="stylesheet">

      <link href="https://fonts.googleapis.com/css2?family=Alegreya:wght@600&display=swap" rel="stylesheet">

</head>

```html
<body style="background-color:powderblue;">

  <!-- bootstrap navbar -->

  <div class="logo mt-3 text-center">

    <a class="main-logo-img mt-5" href="#"><img src="static/img/smartinternz.png" alt="sheep-logo" height="50px" width="180px">

      <!-- <a class="navbar-brand" href="index.html">JobPortal</a> -->

    </a>

  </div>

  <!-- navbar ends -->

  <!-- Login form -->

  <div class="login text-center mt-5">

    <h2> Login Form </h2>

    <form action="/login" method="post">

    <div class="msg">Skill / Job Recommender Application</div>

      <input type="text" name="username" placeholder="Enter Your Username"  id="username" required></br></br>

                        <input type="password" name="password" placeholder="Enter Your Password" id="password" required></br></br>

      </br>

      </br>

    <button type="submit" id="button" class="btn btn-primary"> Login </button>

    </form>

  </div>


  <div class="note mt-3 text-center"> <!--Register form -->

  <p> Don't have an account yet? Click here to <a href="register">register! </a> </p>

  </div>

</body>

</html>
```

Register.html:

```html
<!DOCTYPE html>

<html lang="en">
```

```html
<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <title>JOBPORTAL | LOGIN</title>

        <!-- favicon -->

        <!-- <link rel="shortcut icon" href="/assets/img/favicon.ico" type="image/x-icon"> -->

        <!-- <link rel="icon" href="/assets/img/favicon.ico" type="image/x-icon"> -->

        <link rel="icon" type="image/png" sizes="16x16" href="/assets/img/favicon-32x32.png">

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integrity="sha384-JcKb8q3iqJ61gNV9KGb8thSsNjpSL0n8PARn9HuZOnIxN0hoP+VmmDGMN5t9UJ0Z"
crossorigin="anonymous">

        <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/4.7.0/css/font-
awesome.css">

        <!-- css stylesheet -->

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        <link href="https://fonts.googleapis.com/css2?family=Alegreya:wght@600&display=swap"
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<body style="background-color:powderblue;">

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    <div class="logo mt-3 text-center">

        <a class="main-logo-img mt-5" href="#"><img src="static/img/smartinternz.png" alt="sheep-logo"
height="50px" width="180px">

            <!-- <a class="navbar-brand" href="index.html">JobPortal</a> -->

        </a>

    </div>

     <!-- navbar ends -->

    <!-- Login form -->
```

```html
    <div class="login text-center mt-5">

      <h2> Register Form </h2>

      <form action="/register" method="post">

     <div class="msg">Welcome To Skill / Job Recommender</div>

         <!-- <input type="text" placeholder="fullname" id="fullname"> </br></br> -->


         <input type="text" name="username" placeholder="Enter Your Username"  id="username"
required></br></br>

                          <input type="email" name="email" placeholder="Enter Your Email ID"  id="email"
required></br></br>

                          <input type="password" name="password" placeholder="Enter Your Password"
id="password" required></br></br>


         </br>

         </br>

      <button type="submit" id="button" class="btn btn-primary"> Register </button>

      </form>

   </div>


   <div class="note mt-3 text-center"> <!--Register form -->

   <p> already have an account ? please login  <a href="/login">login! </a> </p>


   </div>

</body>

</html>
```

Dashboard.html:

```html
<!DOCTYPE html>

<html lang="en">

<head>

  <meta charset="UTF-8">

  <meta http-equiv="X-UA-Compatible" content="IE=edge">

  <meta name="viewport" content="width=device-width, initial-scale=1.0">
```

```html
<title>JOBPORTAL | HOME</title>

<meta charset="UTF-8">

    <!-- favicon -->

    <!-- <link rel="shortcut icon" href="/assets/img/favicon.ico" type="image/x-icon"> -->

    <!-- <link rel="icon" href="/assets/img/favicon.ico" type="image/x-icon"> -->

 <link rel="icon" type="image/png" sizes="16x16" href="/assets/img/favicon-32x32.png">

    <!-- bootstrap css cdn -->

    <link rel="stylesheet" href="https://stackpath.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css"
integrity="sha384-JcKb8q3iqJ61gNV9KGb8thSsNjpSL0n8PARn9HuZOnIxN0hoP+VmmDGMN5t9UJ0Z"
crossorigin="anonymous">

    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/4.7.0/css/font-
awesome.css">

    <!-- css stylesheet -->

    <link rel="stylesheet" href="css/style.css">

    <!-- font styles cdn -->

    <link rel="preconnect" href="https://fonts.gstatic.com">

    <link href="https://fonts.googleapis.com/css2?family=Alegreya&display=swap" rel="stylesheet">

    <link href="https://fonts.googleapis.com/css2?family=Alegreya:wght@600&display=swap"
rel="stylesheet">
</head>
<body style="background-color:powderblue;">

    <!-- bootstrap navbar -->

    <nav class="navbar sticky-top navbar-expand-lg navbar-light">

      <div class="container-fluid">

        <a class="main-logo-img mt-3" href="#"><img src="static/img/smartinternz.png" alt="sheep-logo"
height="50px" width="180px">

          <!-- <a class="navbar-brand" href="index.html">JobPortal</a> -->

        </a>

        <button class="navbar-toggler" type="button" data-bs-toggle="collapse" data-bs-
target="#navbarSupportedContent" aria-controls="navbarSupportedContent" aria-expanded="false" aria-
label="Toggle navigation">

          <span class="navbar-toggler-icon"></span>

        </button>
```

```html
    <div class="row donate-sponsor">

      <a type="button" class="btn btn-success mr-1" id="donate" href="/logout">LOGOUT</a>

      <a type="button" class="btn btn-warning mr-1" id="sponsor" href="register">REGISTER</a>

      <a type="button" class="btn btn-primary mr-1" id="sponsor" href="display">MY JOBS</a>

    </div>

  </div>

 </nav>

 <!-- navbar ends -->


<!-- what we focus on -->
<section class="our-focus">

  <div class="container">

    <h2 class="text-center mt-3">Available Jobs</h2>

    <div class="row ml-3 mt-3">

      <div class="col-lg-3 mr-5" id="focus-first">

        <div class="card" style="width: 19rem;">

          <!-- <img src="assets/img/home kids.jpg" class="card-img-top" alt="..."> -->

          <div class="card-body">

            <h5 class="card-title">Python</h5>

            <p class="card-text">Skills for python

            </p>

            <a href="apply" class="btn btn-primary">Apply Now</a>

          </div>

        </div>

      </div>

      <div class="col-lg-3 mr-5" id="focus-second">

        <div class="card" style="width: 20rem;">

          <!-- <img src="assets/img/friendship day.JPG" class="card-img-top" alt="..."> -->

          <div class="card-body">
```

```html
            <h5 class="card-title">Data Scientist</h5>

            <p class="card-text">Skills for datascientist</p>

              <a href="apply" class="btn btn-primary">Apply Now</a>

          </div>

        </div>

      </div>

      <div class="col-lg-3 ml-5" id="focus-third">

        <div class="card" style="width: 20rem;">

          <!-- <img src="assets/img/health camp.jpg" class="card-img-top" alt="..."> -->

          <div class="card-body">

            <h5 class="card-title">HR Manager</h5>

            <p class="card-text">skills for hr manager</p>

              <a href="apply" class="btn btn-primary">Apply Now</a>

          </div>

        </div>

      </div>

    </div>

  </section>

  <!-- focus section ends -->


    <!-- footer starts -->

    <!-- Site footer -->

    </body>

</html>
```

Apply.html:

```html
<!DOCTYPE html>

<html lang="en">

<head>

  <meta charset="UTF-8">
```

```html
<meta http-equiv="X-UA-Compatible" content="IE=edge">

<meta name="viewport" content="width=device-width, initial-scale=1.0">

<title>JOBPORTAL | APPLY</title>

    <!-- favicon -->

    <!-- <link rel="shortcut icon" href="/assets/img/favicon.ico" type="image/x-icon"> -->

    <!-- <link rel="icon" href="/assets/img/favicon.ico" type="image/x-icon"> -->

    <link rel="icon" type="image/png" sizes="16x16" href="/assets/img/favicon-32x32.png">

    <!-- bootstrap css cdn -->

    <link rel="stylesheet" href="https://stackpath.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css"
integrity="sha384-JcKb8q3iqJ61gNV9KGb8thSsNjpSL0n8PARn9HuZOnIxN0hoP+VmmDGMN5t9UJ0Z"
crossorigin="anonymous">

    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/4.7.0/css/font-
awesome.css">

    <!-- css stylesheet -->

    <link rel="stylesheet" href="css/style.css">

    <!-- font styles cdn -->

 <link rel="preconnect" href="https://fonts.gstatic.com">

    <link href="https://fonts.googleapis.com/css2?family=Alegreya&display=swap" rel="stylesheet">

    <link href="https://fonts.googleapis.com/css2?family=Alegreya:wght@600&display=swap"
rel="stylesheet">

</head>

<body style="background-color:powderblue;">

  <!-- bootstrap navbar -->

  <div class="logo mt-3 text-center">

    <a class="main-logo-img mt-5" href="#"><img src="/static/img/smartinternz.png" alt="sheep-logo"
height="50px" width="180px">

      <!-- <a class="navbar-brand" href="index.html">JobPortal</a> -->

    </a>

  </div>

    <!-- navbar ends -->

  <!-- Login form -->

  <div class="login text-center mt-5">

    <h2>Apply Now</h2>
```

```html
      <div class="msg">Welcome To Skill / Job Recommender</div>

    <form action="/apply" method="post" class="mt-3">

      <!-- <input type="text" placeholder="fullname" id="fullname"> </br></br> -->

      <input type="text" name="username" placeholder="Enter Your Username"  id="username"
required></br></br>

      <input type="email" name="email" placeholder="Enter Your email"  id="email" required></br></br>

      <input type="text" name="qualification" placeholder="Enter Your Qualification"  id="qualification"
required></br></br>

                    <input type="text" name="skills" placeholder="Enter Your skills" id="skills"
required></br></br>




       <select name ="s">

<option value ="PYTHON"> Python</option>

<option value ="ML"> ML</option>

<option value ="AI"> AI</option>

</select>

       </br></br>

    <button type="submit" id="button" class="btn btn-primary"> Submit</button>

      </form>

   </div>


 <div class="note mt-3 text-center">

   <p> click here to go to dashboard <a href="dashboard">Dashboard! </a> </p>



   </div>

</body>

</html>
```

Display.html:

```html
<!DOCTYPE html>

<html lang="en">
```

```html
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>JOBPORTAL | HOME</title>
        <div class="msg">Welcome To Skill / Job Recommender</div>
    <meta charset="UTF-8">
        <!-- favicon -->
                        <!-- <link rel="shortcut icon" href="/assets/img/favicon.ico" type="image/x-icon"> -->
        <!-- <link rel="icon" href="/assets/img/favicon.ico" type="image/x-icon"> -->
        <link rel="icon" type="/image/png" sizes="16x16" href="/assets/img/favicon-32x32.png">
        <!-- bootstrap css cdn -->
        <link rel="stylesheet" href="https://stackpath.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css" integrity="sha384-JcKb8q3iqJ61gNV9KGb8thSsNjpSL0n8PARn9HuZOnIxN0hoP+VmmDGMN5t9UJ0Z" crossorigin="anonymous">
        <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/4.7.0/css/font-awesome.css">
        <!-- css stylesheet -->
        <link rel="stylesheet" href="css/style.css">
        <!-- font styles cdn -->
        <link rel="preconnect" href="https://fonts.gstatic.com">
        <link href="https://fonts.googleapis.com/css2?family=Alegreya&display=swap" rel="stylesheet">
        <link href="https://fonts.googleapis.com/css2?family=Alegreya:wght@600&display=swap" rel="stylesheet">
</head>
<body style="background-color:powderblue;">
        <!-- bootstrap navbar -->
        <nav class="navbar sticky-top navbar-expand-lg navbar-light">
            <div class="container-fluid">
                <a class="main-logo-img mt-3" href="#"><img src="static/img/smartinternz.png" alt="sheep-logo" height="50px" width="180px">
                    <!-- <a class="navbar-brand" href="index.html">JobPortal</a> -->
                </a>
```

```html
<button class="navbar-toggler" type="button" data-bs-toggle="collapse" data-bs-target="#navbarSupportedContent" aria-controls="navbarSupportedContent" aria-expanded="false" aria-label="Toggle navigation">

  <span class="navbar-toggler-icon"></span>

</button>


<div class="row donate-sponsor">

 <a type="button" class="btn btn-success mr-1" id="donate" href="/logout">LOGOUT</a>

 <a type="button" class="btn btn-warning mr-1" id="sponsor" href="register">REGISTER</a>

 <a type="button" class="btn btn-primary mr-1" id="sponsor" href="display">MY JOBS</a>

</div>

</div>

</nav>

<!-- navbar ends -->


<!-- what we focus on -->
<section class="our-focus">

  <div class="container">

   <h2 class="text-center mt-3">Your details</h2>

   <div class="border">

   <table class="worddark"></br></br></br></br>

  <tr>

  <td>userid:</td>

  <td>Ayisha Benazir K</td>

   </tr>

  <tr>

   <td>username:</td>

  <td>Ayisha Benazir K</td>

  </tr>

  <tr>

  <td>Email ID:</td>
```

```html
        <td>benazirayisha6@gmail.com</td>

      </tr>

      <tr>

      <td>qualification:</td>

      <td>B.tech</td>

      </tr>

      <tr>

       <td>skills:</td>

      <td>Web Developer</td>

      </tr>

        <tr>

      <td>JOB Applied:</td>

      <td>Web Development</td>

</tr>

</table>

 </section>

</body>

</html>
```

Style.css:

```css
{

   font-family: 'Alegreya', serif !important;

}


/* // Small devices (landscape phones, 576px and up) */

@media (min-width: 576px) {


 }


/* // Medium devices (tablets, 768px and up) */

@media (min-width: 768px) {
```

```css
  }


/* // Large devices (desktops, 992px and up) */

@media (min-width: 992px) {

    .navbar {

        padding-top:15px;

        padding-bottom:15px;

        background-color: white;

    }

    .navbar-brand{

        padding-left: 5px;

    }

    .navbar-nav {

        margin-left: 30px;

    }

    .nav-item {

        padding-left:5px;

    }

    .donate-sponsor{

        margin-right:10px;

    }

    #donate,#sponsor{

        margin:5px;

        padding: 5px 15px 5px 15px;

    }

    .homepage-header{

        background: url('../img/group.JPG');

        background-size: cover;

        background-position: center top;
```

```css
    padding: 0;

    position: relative;

    width: 100%;

    overflow: hidden;

    display: -webkit-flex;

    display: -ms-flexbox;

    display: flex;

    height: 85vh;

}

.home-for-children {

    background-color: #ffeeba;

    margin-top:0px;

    padding-top:10px;

    padding-bottom:30px;

}

.home-for-children h2 {

    line-height: 2.5rem !important;

    letter-spacing: 3px;

    font-weight: 600;

}

.home-for-children h5 {

    line-height: 1.8rem;

}

.home-for-children .btn-success {

    padding: 8px 25px;

    font-size: large;

}

/* our focus */

.our-focus .container {

    margin-top:3rem !important;
```

```css
}

.our-focus .row{

    margin-top:1.5rem !important;

}

.our-focus .card {

    border: none !important;

}

.our-focus #focus-first {

    margin-right:80px;

}

.our-focus #focus-second {

    margin-right:90px;

}
/* media */

.media .container{

    margin-top: 3rem !important;

}

.media .row{

    margin-top: 1.5rem !important;

}
/* footer */

.row-initiative {

    margin-top:10px

}

.site-footer {

    margin-top:30px;

    line-height:24px;

}

.footer-links {
```

```css
    padding-left:0;

    list-style: none;

}

.footer-links li {

    display: block;

}

.footer-links.inline li {

    display: inline-block;

}

.footer-links li a{

    color: black;

}

.footer-logo img{

    width: 100px;

}

.social-icons {

    text-align: right;

    margin-left:50px;

}

.social-icons li{

    list-style: none;

    display: inline-block;

}

.social-icons li a {

    border-radius: 50%;

    margin-left:10px;

}

input {

    padding:10px 20px;

    }
```

```
  #button {

    border:none;

    padding:10px 20px;

    border-radius:10px;

    animation:pulse 3s infinite ease-out;

  }

}


/* // X-Large devices (large desktops, 1200px and up) */

@media (min-width: 1200px) {

  .navbar-brand{

    padding-left: 10px;

  }

}


/* // XX-Large devices (larger desktops, 1400px and up) */

@media (min-width: 1400px) {

  .navbar-brand{

    padding-left: 15px;

  }

}
```

6. Reports From JIRA:

6.1 Acceptance Testing
UAT Execution & Report Submission

1. Purpose of Document:

The purpose of this document is to briefly explain the test coverage and open issues of the Skills and Job Recommendation project at the time of the release to User Acceptance Testing (UAT).

2. Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	10	4	2	3	20
Duplicate	1	1	3	1	6
External	2	3	0	1	6
Fixed	11	2	4	20	37
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won't Fix	0	5	2	1	8
Totals	24	14	13	26	80

3. Test Case Analysis

This report shows the number of test cases that have passed, failed, and untested

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	7	0	1	7
Client Application	51	0	1	51
Security	2	0	2	2
Outsource Shipping	3	0	1	3
Exception Reporting	9	0	1	9
Final Report Output	4	0	1	4
Version Control	2	0	0	2

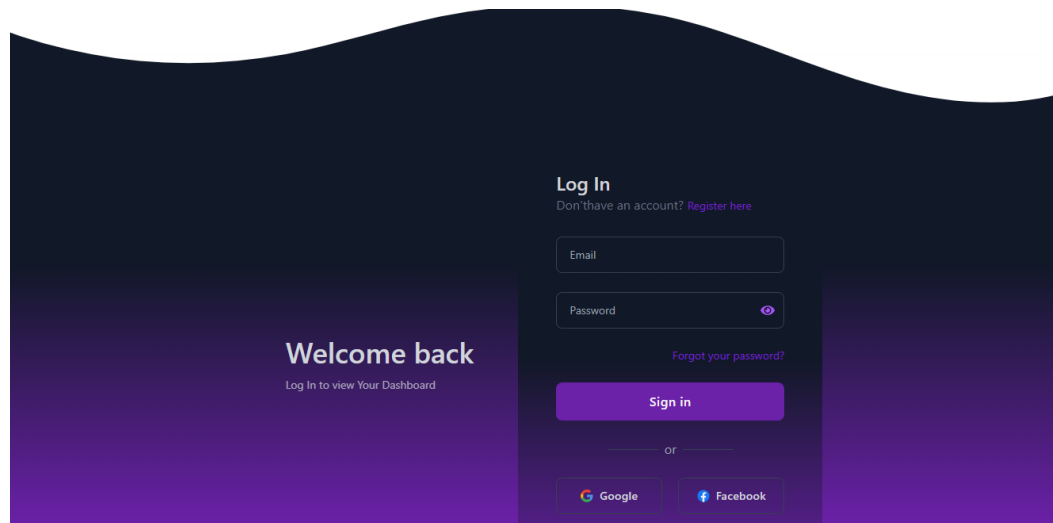**7.Outputs:**

Home Page:
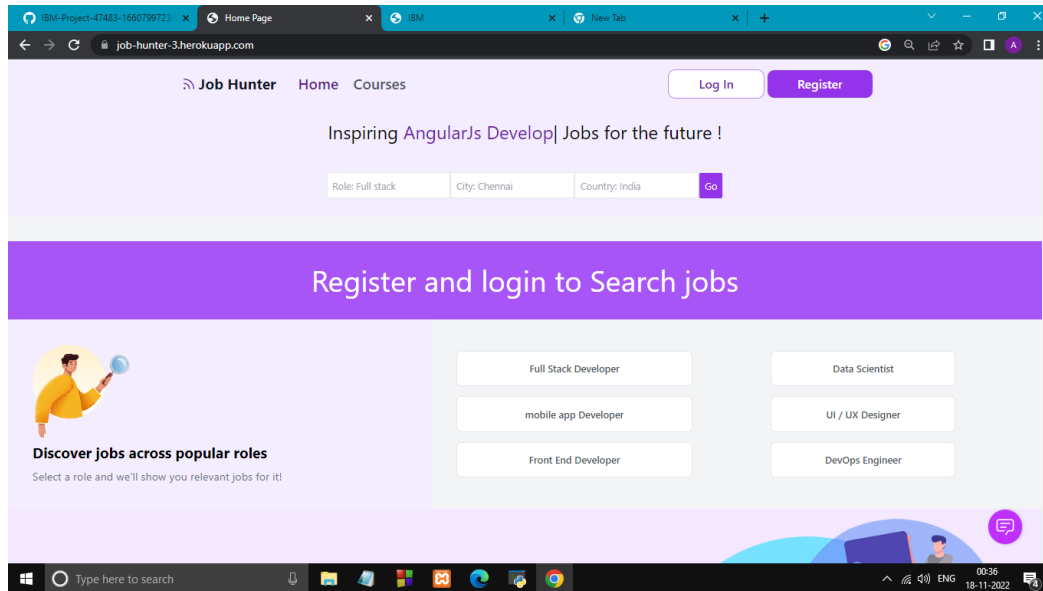
Register Page:
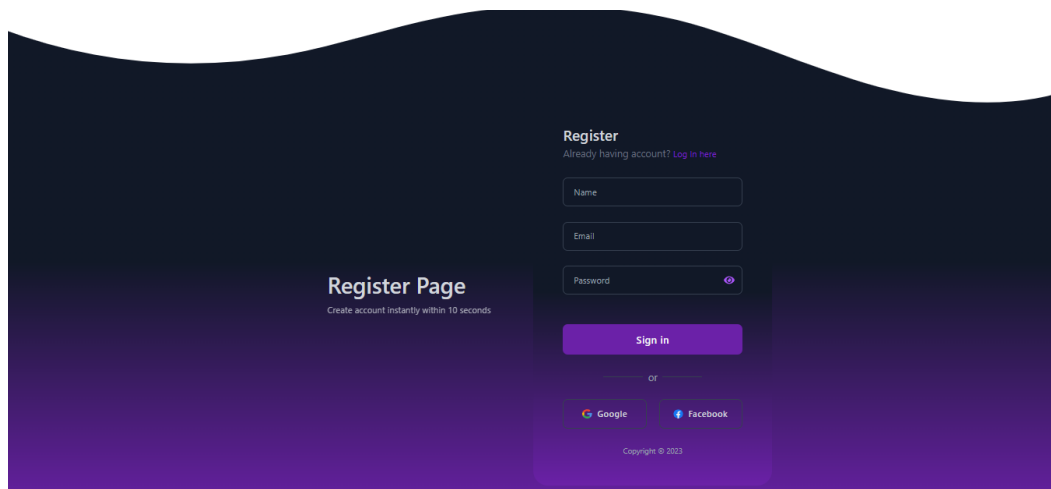
Login Page:

8. Future work and Discussion

8.1 Future work:

Based on the current study, the recommendation system works on the content-based filtering using word embedding of word2vec and similarity measure of cosine similarity. As the corpus provides general information about the word and similar words around it, It is possible to create a better recommendation by creating a corpus related to the IT skills, terminology, Job domain and jargon of the industry. By using such corpus specific to the hiring domain, the recommendation could be better when analyzing implicit text data in the job description. It can be categorized in a better way.

As this Recsys is currently working on data that has no interaction, a study needs to be conducted on the data that has previous interaction in the hiring domain. This would allow us to dynamically keep recommending new jobs based on user's change in preferences. There is a recommender system in the hiring domain from LinkedIn but not in the perspective of a job seeker but from the perspective of a recruiter. Similarly, we could conduct a study based on LinkedIn data to recommend jobs using content-based filtering. As conditions change from domain to domain, it is not a good idea to recommend a job because a user liked it; instead, the recommendation has to be considered, if the profile of a 6.2 Discussion 49 user matches the requirement. So, conducting more study based on content-based filtering ensemble with other filtering technique in hiring domain in the perspective of a job seeker can be considered as a part of future work.

8.2 Discussion:

This study on recommender system in the field of the hiring domain concentrates on analysing the skills required for the job, to which domain user fall into; using this as a parameter to compute the similarity between available position and user. The available recommender

system in the domain of news or the field of entertainment relies on user interaction. Interaction such as ratings provided by the user on a particular item, to make an item recommendation to a user but this concept of ratings and predicting the likelihood of a user to choose an item would be incorrect when it is viewed in the perspective of job domain or recruiter. Implementation of a recommender system that is based on ratings, number of views and popularity of an item in the job domain would allow the user to apply most of the job that he sees online. However, this would hamper the process of hiring due to the clogging of profile at the recruiter end. In this study, we recommend the job that is similar to the user profile by analysing the user preference of the user using content-based filtering. Using this process of recommendation would efficiently make the user apply only to the jobs that he might be suited to, instead of applying to most of the jobs that are available in the system. This recommender system would ease the burden of a recruiter by reducing the number of irrelevant applicants.

9. CONCLUSION:

Therefore, We conclude that job recommendation system with analysis of job description to recommend a job based on user's skills and preferences presents itself as worthy Recsys model in recommending open position to the job seekers when looking for a new positions. Thus, among the different threshold and filtering techniques, we chose to model the recommender system using content-based filtering which is achieving F1-score of 66% with the threshold of 0.3 with average coverage of 53%.

10. REFERENCES:

1. Al-Otaibi, S.T. and Ykhlef, M. (2012) Job recommendation systems for enhancing recruitment process in: Proceedings of the International Conference on Information and Knowledge Engineering (IKE) p. 1 The Steering Committee of The World Congress in Computer Science, Computer . . . https://ijcrt.org/papers/IJCRT2208099.pdf

2. Adomavicius G, Tuzhilin A (2005). Toward the Next Generation of Recommender Systems: A Survey of the State-of-the-Art and Possible Extensions. IEEE Trans. Knowl. Data Eng. 17(6):734-749.

3. Barbieri N, Costa G, Manco G, Ortale R (2011). Modeling Item Selection and Relevance for Accurate Recommendations: A Bayesian Approach. In Proceedings of the fifth ACM conference on Recommender systems (RecSys '11), Chicago, Illinois, USA, ACM pp. 21-28.
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4.Jain, H. and Kakkar, M. (2019) Job recommendation system based on machine learning and data mining techniques using restful api and android ide in: 2019 9th International Conference on Cloud Computing, Data Science & Engineering (Confluence) pp. 416–421 IEEE

https://esource.dbs.ie/bitstream/handle/10788/4254/msc_jeevankrishna_2020.pdf?sequence=1&isAllowed=y .