SKILL / JOB RECOMMENDER APPLICATION

TEAM ID PNT2022TMID11942

TEAM MEMBERS:

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AATHMIGA . M
DEEPIKA . V
KANISHKAR . R

PROJECTREPORT

INTRODUCTION

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 usingthe search option or they can directly interact with the chatbot and get their dream job.

PROJECT OVERVIEW

There has been a sudden boom in the technical industry and an increase in the number of good startups. Keeping track of various appropriate job openings in top industry names has become increasingly troublesome. Thisleads to deadlines and hence important opportunities being missed.
Through this research paper, the aim is to automate this process to eliminate this problem. To achieve this, IBM cloud services like db2, Watson assistant , cluster, kubernetes have been used. A hybrid system of Content-Based Filtering and Collaborative Filtering is implemented to recommend these jobs. The intention is to aggregate and recommend appropriate jobs to job seekers, especially in the engineering domain. The entire process of accessing numerous company websites hoping to find a relevant job opening listed on their career portals is simplified. The proposed recommendation system is tested on an array of test cases with afully functioning user interface in the form of a web application. It has shown satisfactory results, outperforming the existing systems. It thus testifies to the agenda of quality over quantity

PURPOSE

With an increasing number of cash-rich, stable, and promising technical companies/startups on the web which are in much demand right now, many candidates want to apply and work for these companies. They tend to miss out on these postings because there is an ocean of existing systemsthat list millions of jobs which are generally not relevant at all to the users.There is an abundance of choices and not much streamlining. On the basis of the actual skills or interests of an individual, job seekers often find themselves unable to find the appropriate employment for themselves.
This system, therefore, approaches the idea from a data point of view, emphasizing more on the quality of the data than the quantity.

LITERATURE SURVEY

EXISTING PROBLEM

Existing system is not very efficient , it does not benefit the user in maximum way, so the proposed system uses ibm cloud services like db2, Watson virtual assistant , cluster , kubernetes and docker for containerization of the application.

REFERENCES

Shaha T Al-Otaibi and Mourad Ykhlef. “A survey of job recommender systems”.In: International Journal of the Physical Sciences 7.29 (2012), pp. 5127–5142. issn: 19921950. doi: 10.5897/IJPS12. 482

● N Deniz, A Noyan, and O G Ertosun. “Linking Person-job Fit to Job Stress: TheMediating Effect of Perceived Person-organization Fit”. In: Procedia - Social and Behavioral Sciences 207 (2015), pp. 369– 376.

● M Diaby, E Viennet, and T Launay. “Toward the next generation of recruitment tools: An online social network-based job recommender system”. In: Proc. of the 2013 IEEE/ACM Int. Conf. on Advances in Social Networks Analysis and Mining, ASONAM 2013 (2013), pp. 821–828. doi: 10. 1145/2492517.2500266.

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● T Mikolov et al. “Distributed Representations of Words and Phrases and Their Compositionality”. In: Proc. of the 26th Int. Conf. on Neural Information
Processing Systems - Volume 2. NIPS’13. Lake Tahoe, Nevada, 2013, pp. 3111–3119. url: http://dl.acm.org/citation.cfm?id=2999792. 2999959.

● T Mikolov et al. “Efficient estimation of word representations in vector space”. In: arXiv preprint arXiv:1301.3781 (2013).

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PROBLEM STATEMENT DEFINITION

"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?".

In current situation recruitment s done manually for lakhs of students in which many talented students may lose their opportunities due to different reasons since it is done manually, and company also need the highly talented people fromthe mass group for their growth. So we have build a cloud application to do this process in a efficient manner.

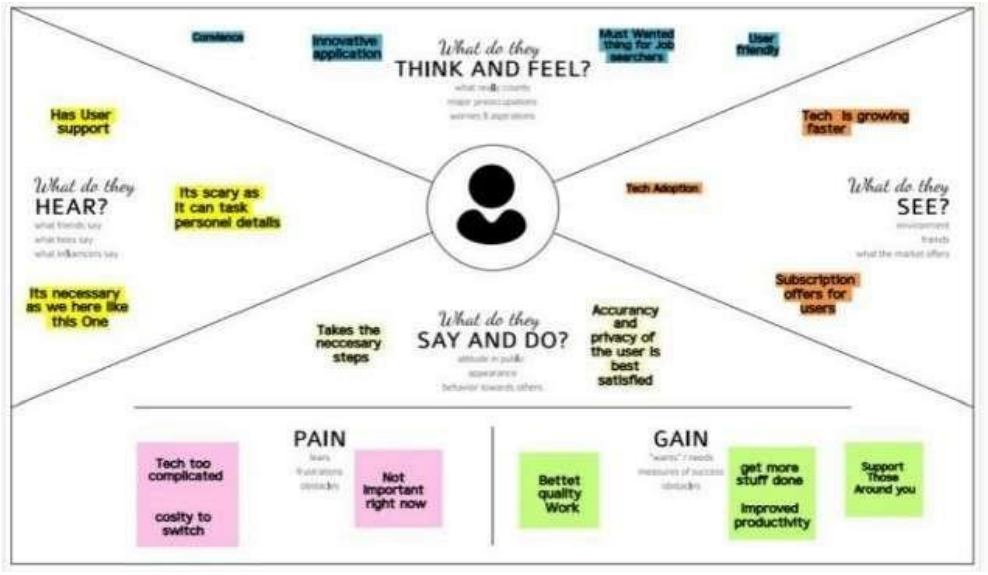
❖ IDEATION AND PROPOSED SOLUTION

EMPATHY MAP

An empathy map is a collaborative visualization used to articulate what we know about a particular type of user. It externalizes knowledge about users inorder to

1) Create a shared understanding of user needs, and

2) Aid in decision making



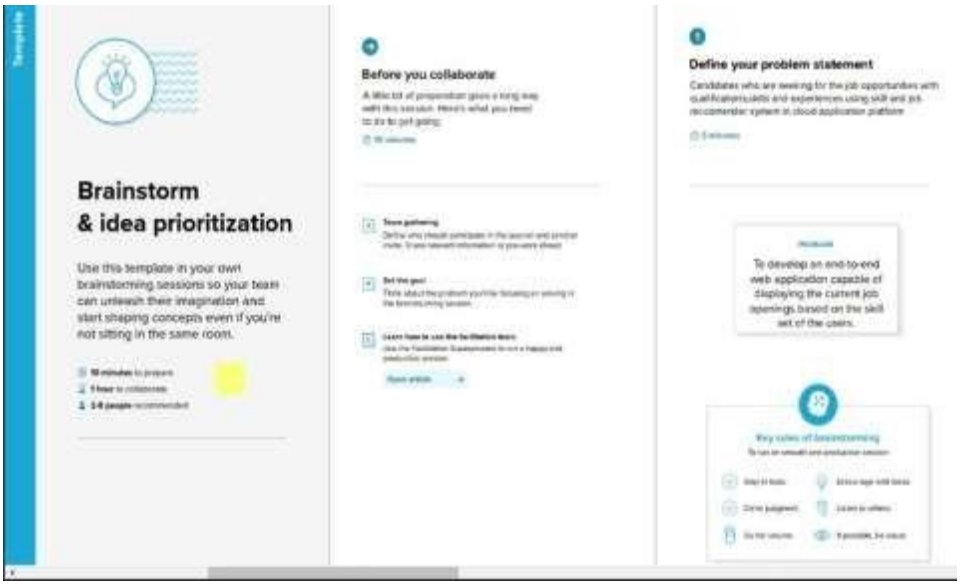
❖ IDEATION AND BRAINSTROMING

Brainstorm & Idea Prioritization Template:

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions. Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

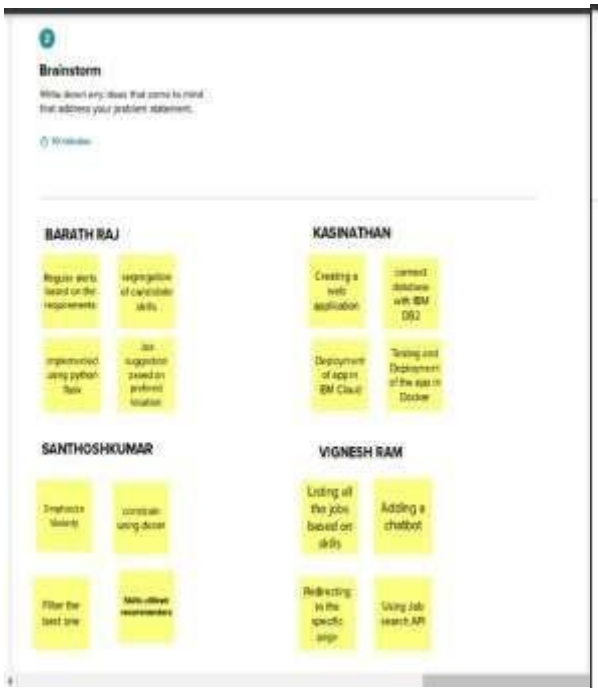
STEP 1:

Team Gathering, Collaboration and Select the Problem Statement



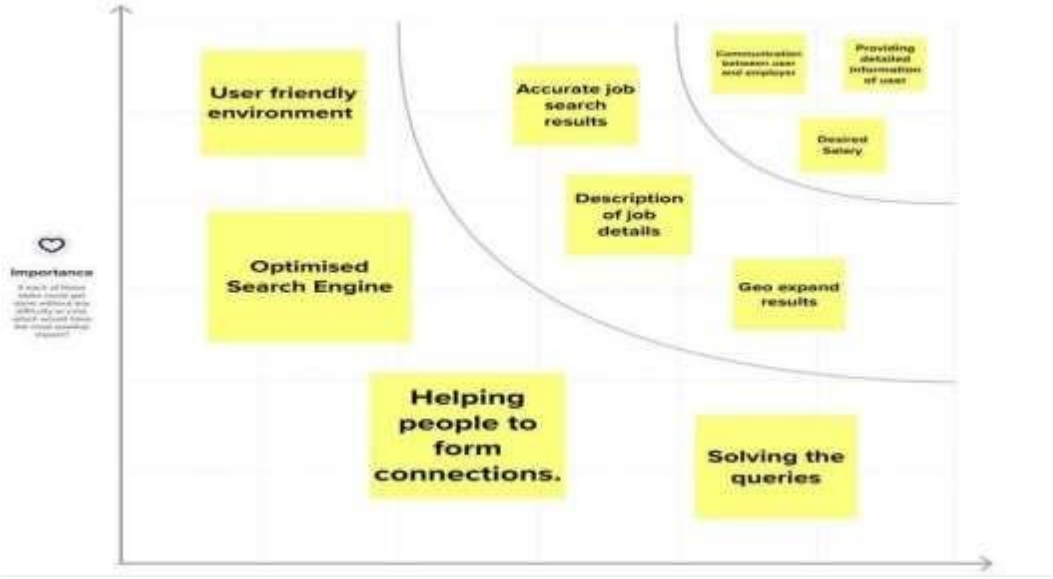
STEP 2:

Brainstorm, Idea Listing and Grouping



STEP 3:

Idea Prioritization



❖ PROPOSED SOLUTION

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 thejobs 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 isan 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

❖ PROBLEM SOLUTION FIT

4.REQUIREMENT ANALYSIS

❖ FUNCTIONAL REQUIREMENT

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail/Email Registration through LinkedIn
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User Dashboard	Update User Details Upload Resume
FR-4	User Portal	Recommendations based on profile information Recommendations based on profile information for learning opportunities Get the latest news about living and working conditions
FR-5	Chat-bot/Job Search API	Recommendations based on your search query Search query-based recommendations for learning opportunities Find news articles related to living and working conditions based on your search query

❖ NON FUNCTIONAL REQUIREMENTS

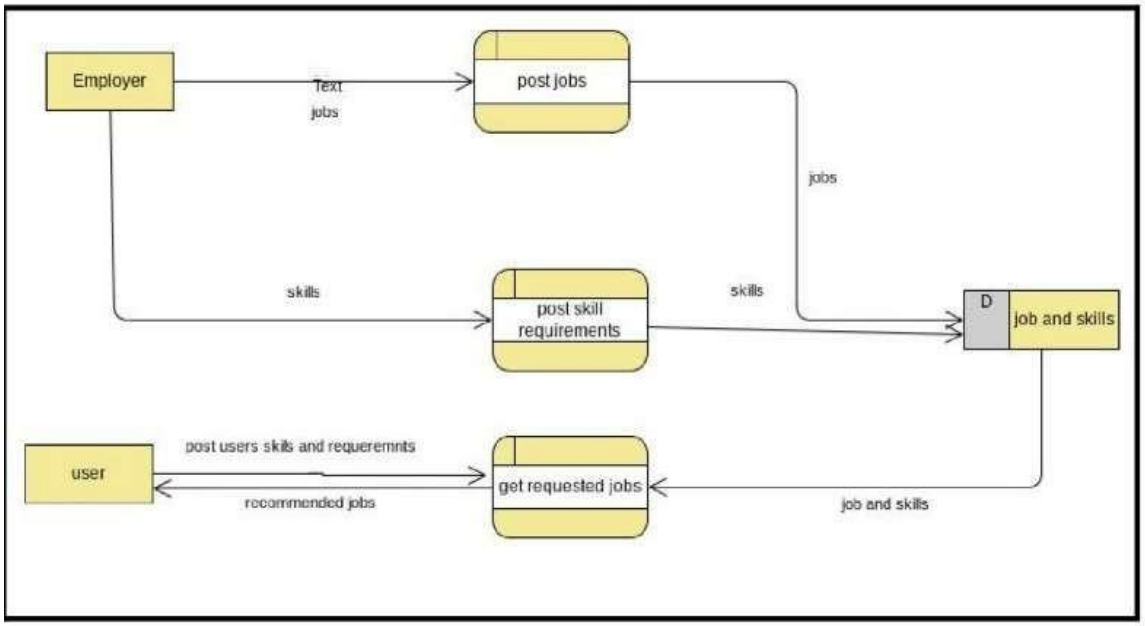
Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Users who are seeking for employment.
NFR-2	**Security**	The privacy of the users should be guaranteed in the system.
NFR-3	**Reliability**	Integrity and consistency of the recommender engine and all its transactions should be ensured
NFR-4	**Performance**	The recommender engine should generate recommendations within a time frame of 500 milliseconds
NFR-5	**Availability**	The recommender engine should be available 24/7 to provide suggestions to the end user.
NFR-6	**Scalability**	The recommender engine should be scalable.

5 PROJECT DESIGN

❖ DATAFLOW DIAGRAM



❖ TECHNICAL ARCHITECTURE

Solution architecture is a complex process – with many sub-processes – that bridges

the gap between business problems and technology solutions. Its goals are to:

• Find the best tech solution to solve existing business problems.

• Describe the structure, characteristics, behaviour, and other aspects of the

software to project stakeholders.

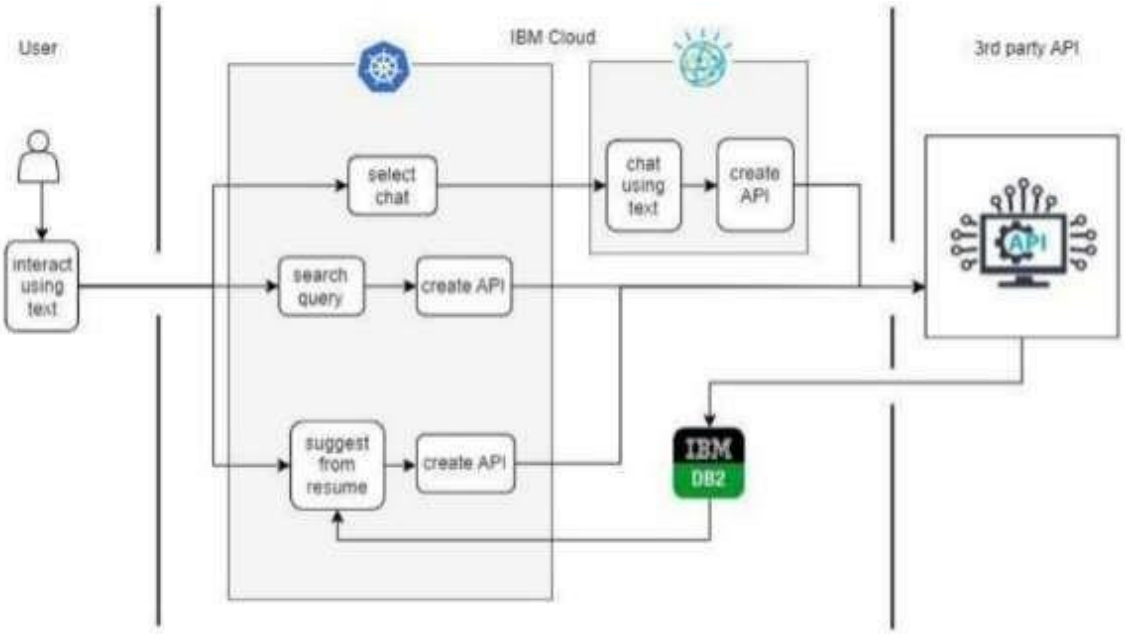
• Define features, development phases, and solution requirements.

• Provide specifications according to which the solution is defined, managed

and delivered.

• Provide the best business require recommend by using the optimised and efficient algorithm

• Differentiate the fake job recommend by fake sites and be aware from the Scammers



6 PROJECT PLANNING AND SCHEDULING

❖ SPRINT PLANNING AND EXSTIMATION

Title	Description
Information Gathering Literature Survey	Referring to the research publications & technical papers, etc.
Create Empathy Map	Preparing the List of Problem Statements and to capture user pain and gains.
Ideation	Prioritise a top ideas based on feasibility and Importance.
Proposed Solution	Solutions including feasibility, novelty, social impact, business model and scalability of solutions.
Problem Solution Fit	Solution fit document.
Solution Architecture	Solution Architecture.
Customer Journey	To Understand User Interactions and experiences with application.
Functional Requirement	Prepare functional Requirement.
Data flow Diagrams	Data flow diagram.
Technology Architecture	Technology Architecture diagram.
Milestone & sprint delivery plan	Activities are done & further plans.
Project Development Delivery of sprint 1,2,3 & 4	Develop and submit the developed code by testing it.

❖ SPRINT DELIVERY SCHEDULE

SPRINT	TASK	MEMBERS
SPRINT 1	Create Registration page , login page , Job search portal , job apply portal in flask	BARATH RAJ G
SPRINT 2	Connect application to ibm db2	SANTHOSH KUMAR D
SPRINT 3	Integrate ibm Watson assistant	KASINATHAN N
SPRINT 4	Containerize the app and Deploy the application in ibm cloud	VIGNESH RAM S

❖ REPORTS FROM JIRA:

Average Age Report.
Created vs Resolved Issues Report.
Pie Chart Report.
Recently Created Issues Report.
Resolution Time Report.
Single Level Group By Report.
Time Since Issues Report.
Time Tracking Report.

CODING & SOLUTIONING

Feature 1:

- **App Market**

This is one of the feature of our application Skill Pal which provides companies job details for end users

```
@app.route('/jobmarket')
def jobmarket():
    jobids = []
    jobnames = []
    jobimages = []
    jobdescription = []

    sql = "SELECT * FROM JOBMARKET"
    stmt = ibm_db.prepare(conn, sql)
    username = session['username']
    print(username)
    #ibm_db.bind_param(stmt,1,username)
    ibm_db.execute(stmt)
    joblist = ibm_db.fetch_tuple(stmt)
    print(joblist)
    while joblist != False:
        jobids.append(joblist[0])
        jobnames.append(joblist[1])
        jobimages.append(joblist[2])
        jobdescription.append(joblist[3])
        joblist = ibm_db.fetch_tuple(stmt)

    jobinformation = []

    cols = 4
    size = len(jobnames)
    for i in range(size):
        col = []
        col.append(jobids[i])
        col.append(jobnames[i])
        col.append(jobimages[i])
        col.append(jobdescription[i])
        jobinformation.append(col)
    print(jobinformation)

    return render_template('jobmarket.html', jobinformation = jobinformation)

@app.route('/filterjobs')
```

```
def filterjobs():
   skill1 = ""
   skill2 = ""
   skill3 = ""
   user = session['username']
   sql = "SELECT * FROM ACCOUNTSKILL WHERE USERNAME = ?"
   stmt = ibm_db.prepare(conn, sql)
   ibm_db.bind_param(stmt,1,user)
   ibm_db.execute(stmt)
   skillres = ibm_db.fetch_assoc(stmt)
   if skillres:
      skill1                    =
      skillres['SKILL1']
      skill2                    =
      skillres['SKILL2']
      skill3                    =
      skillres['SKILL3']
      print(skillres)
      jobids = []
      jobnames = []
      jobimages = []
      jobdescription = []

      sql = "SELECT * FROM JOBMARKET"
      stmt = ibm_db.prepare(conn, sql) username
      = session['username'] print(username)
      #ibm_db.bind_param(stmt,1,username)
      ibm_db.execute(stmt)
      joblist = ibm_db.fetch_tuple(stmt)
      print(joblist)
      while joblist != False:
         jobids.append(joblist[0])
         jobnames.append(joblist[1])
         jobimages.append(joblist[2])
         jobdescription.append(joblist[3])
         joblist = ibm_db.fetch_tuple(stmt)

      jobinformation = []

      cols = 4
      size = len(jobnames)
      print("$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$4",skill1,skill2,skill3)

      for i in range(size):
         col = []

print("@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
@@@@@@@@@@@@@@@@",jobdescription[i])
         if jobdescription[i].lower() == skill1.lower() or jobdescription[i].lower() == skill2.lower() or
jobdescription[i].lower() == skill3.lower() :
```

```
            col.append(jobids[i])
            col.append(jobnames[i])
            col.append(jobimages[i])
            col.append(jobdescription[i])
            jobinformation.append(col)

print("@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
@@@@@@@@@@@@@@@@",jobinformation)

    return render_template('jobmarket.html', jobinformation = jobinformation)
```

Feature 2:

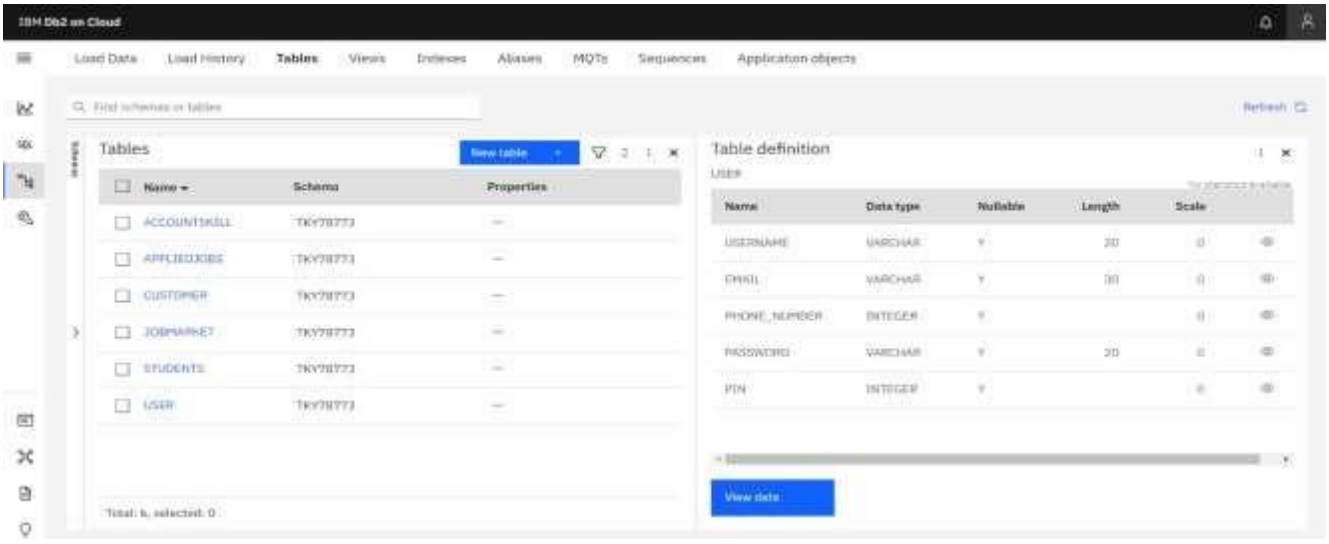
- **ChatBot (using IBM Watson)**

This chat bot feature provides help tooltip for end users if any help needed for users

```
<script>
     window.watsonAssistantChatOptions = {
      integrationID: "9be41b76-06b0-426f-8469-962f2963cdb6", // The ID of this integration.
      region: "au-syd", // The region your integration is hosted in.
      serviceInstanceID: "76838ca2-a227-4f56-b180-94f01901cdbf", // The ID of your service instance.
      onLoad: function(instance) { instance.render(); }
     };
     setTimeout(function(){
      const t=document.createElement('script');
      t.src="https://web-chat.global.assistant.watson.appdomain.cloud/versions/" +
(window.watsonAssistantChatOptions.clientVersion || 'latest') + "/WatsonAssistantChatEntry.js";
      document.head.appendChild(t);
     });
    </script>
```

- Database Schema:

We user IBM DB2 for our database, below are the tables we used with the parameters given.


IBM Db2 on Cloud
Load Data
Load History
Tables
Views
Indexes
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Application objects
Refresh
Tables
New table
Name
Schema
Properties
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APPLIEDJOBS
CUSTOMER
JOBMARKET
STUDENTS
USER
Total: 6, selected: 0
Table definition
USER
Name
Data type
Nullable
Length
Scale
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EMAIL
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PHONE_NUMBER
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PIN
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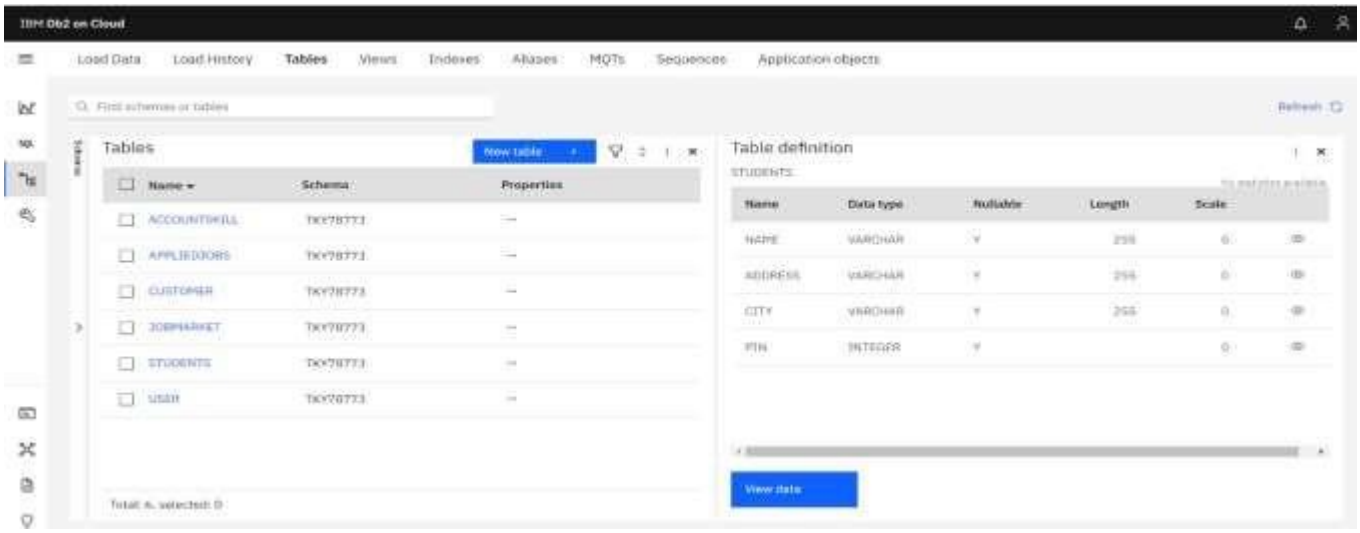
View data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APPLIEDJOBS
CUSTOMER
JOBMARKET
STUDENTS
USER
Total: 6, selected: 0
Table definition
STUDENTS
Name
Data type
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NAME
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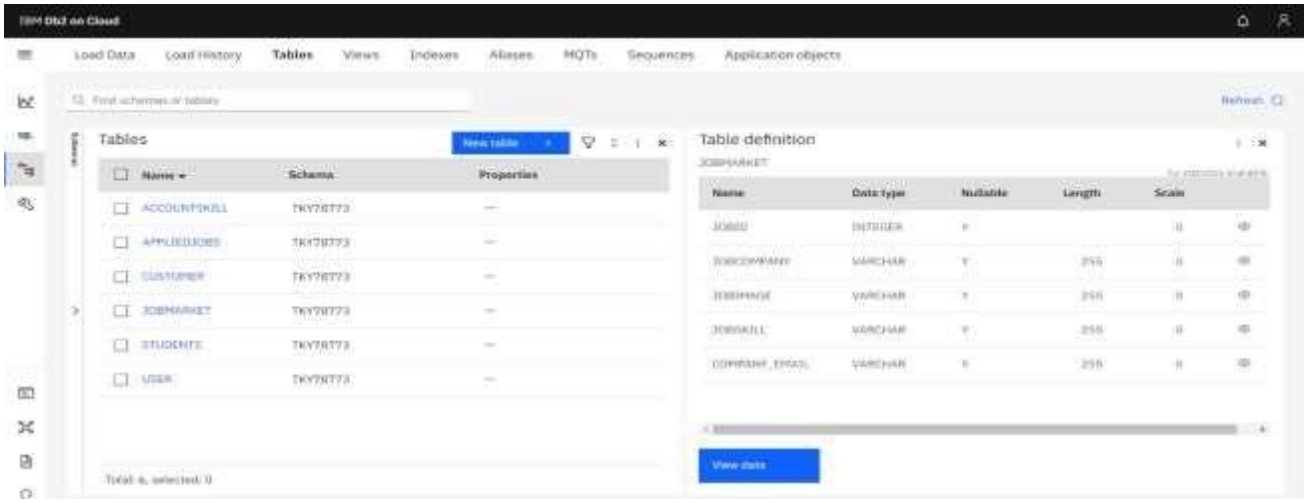
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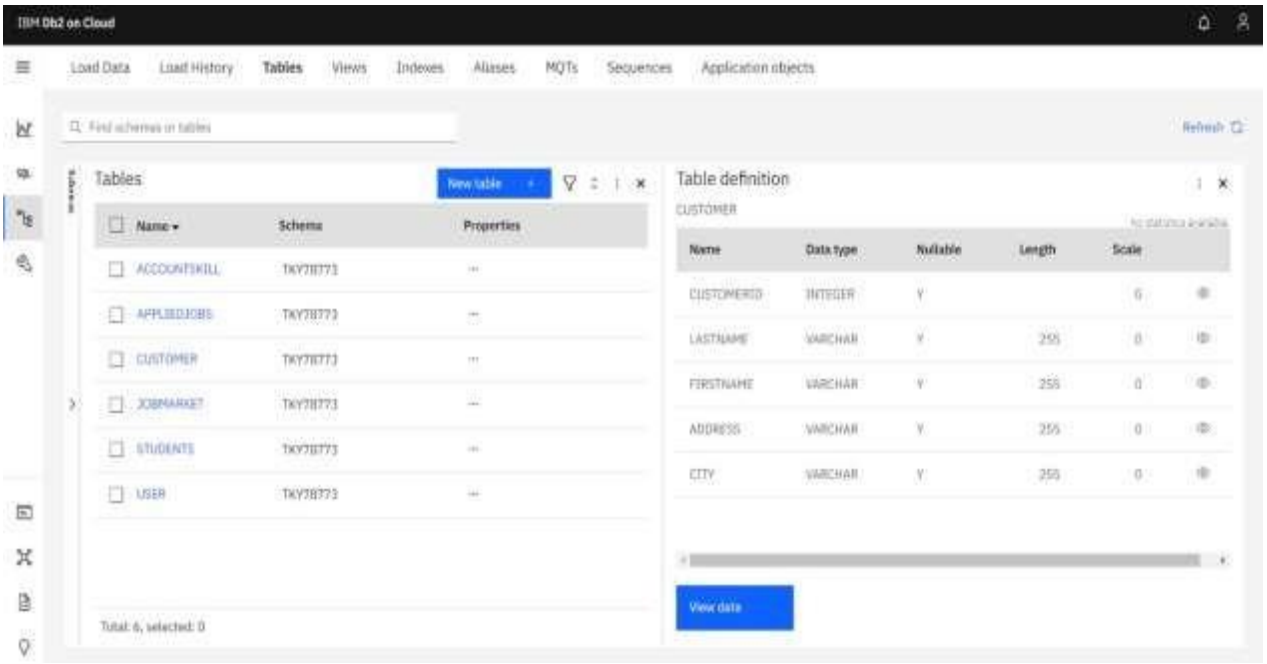
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JOBMARKET
STUDENTS
USER
TKY78773
Total: 6, selected: 0
Table definition
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Name
Data type
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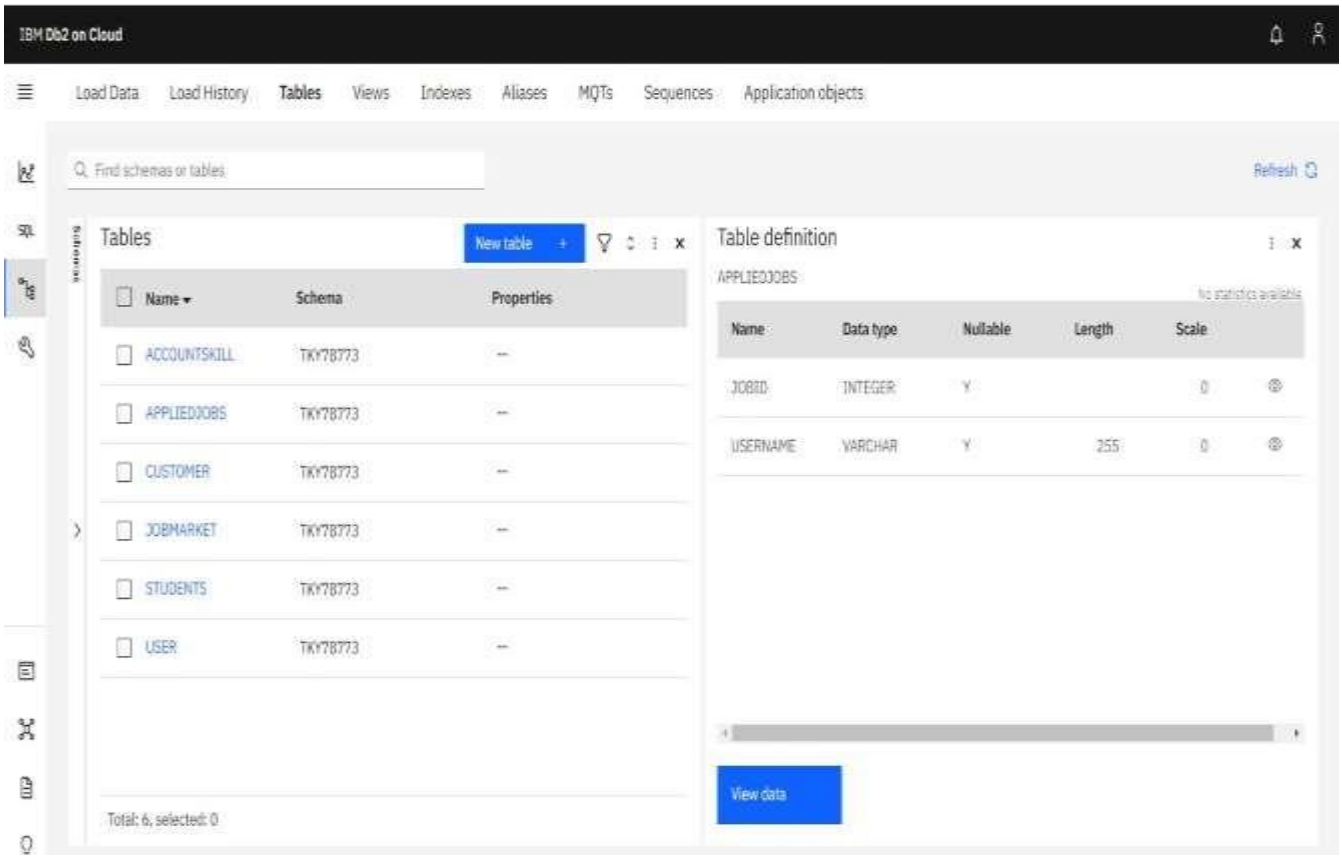
FIRSTNAME
ADDRESS
CITY
View data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STUDENTS
USER
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USERNAME
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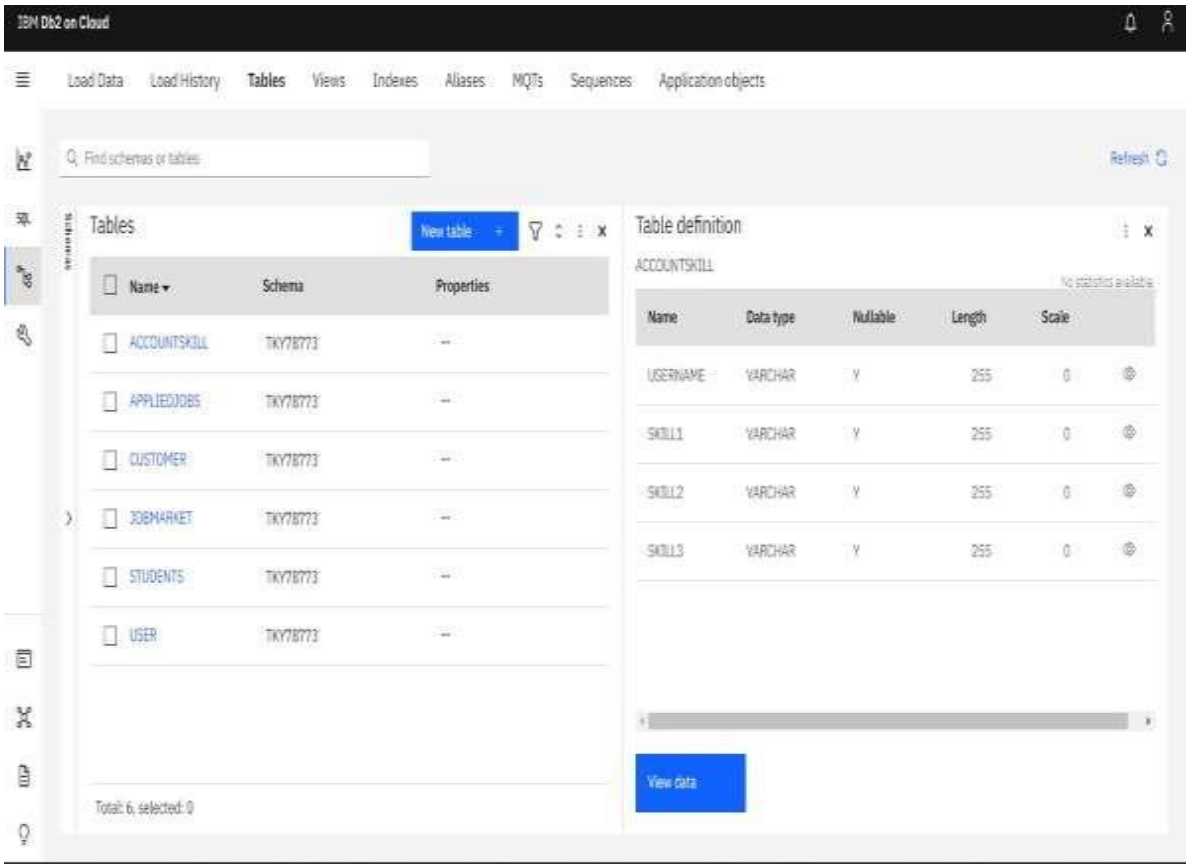
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Table definition
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View data

TESTING

- Test Cases:

We tested for various validations. Tested all the features with using all the functionalities. Tested the data base storage and retrieval feature too.

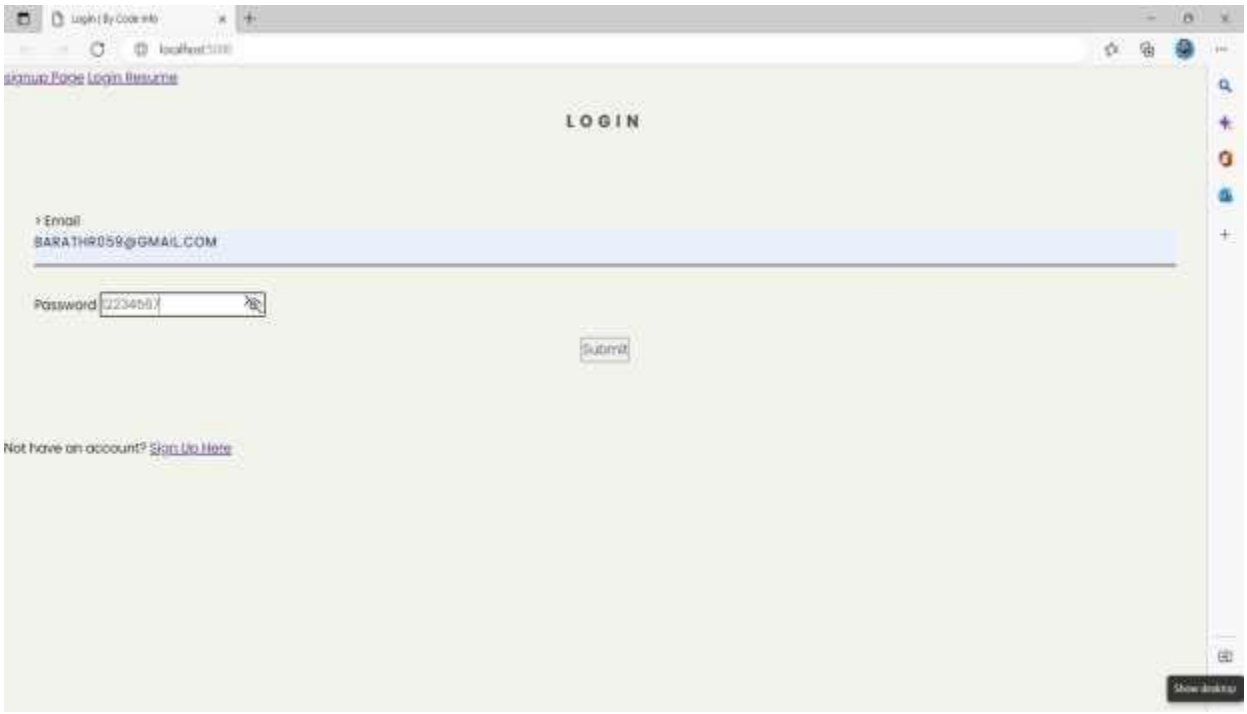
Testing was done in phase 1 and phase 2, where issues found inphase1 werefixed and then tested again in phase2.

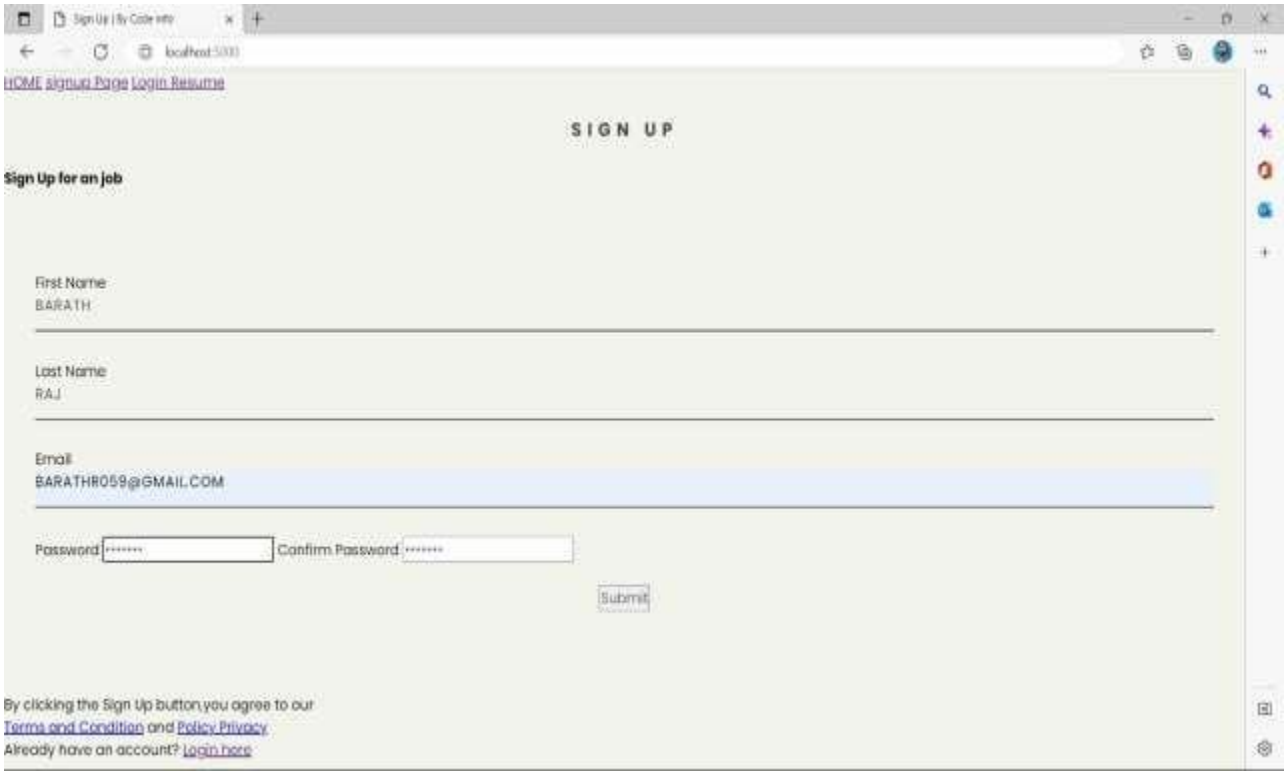
User Acceptance Testing:

Real world testing was also done, by giving to remote users and asking them touse the application. Their difficulties were fixed and tested again until all the issues were fixed.

RESULTS

- ❖ Perfomance Metrics:





RESUME UPLOAD

a”xea s”Dss o,suaiLcou

• KEEP IN TOUCH •

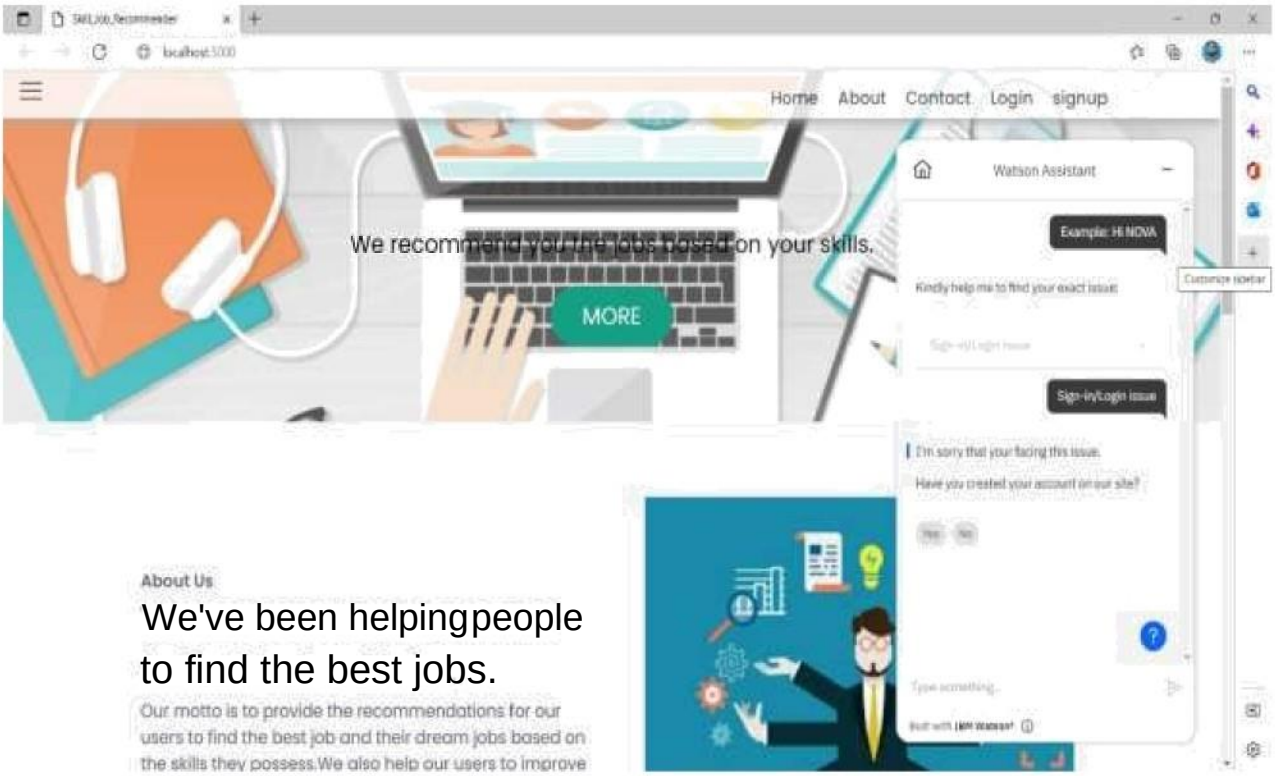
BARATHRAJ.G

BARATHR059@GMAIL.COM

9360149506

I'D LIKE TO START A PROJECT

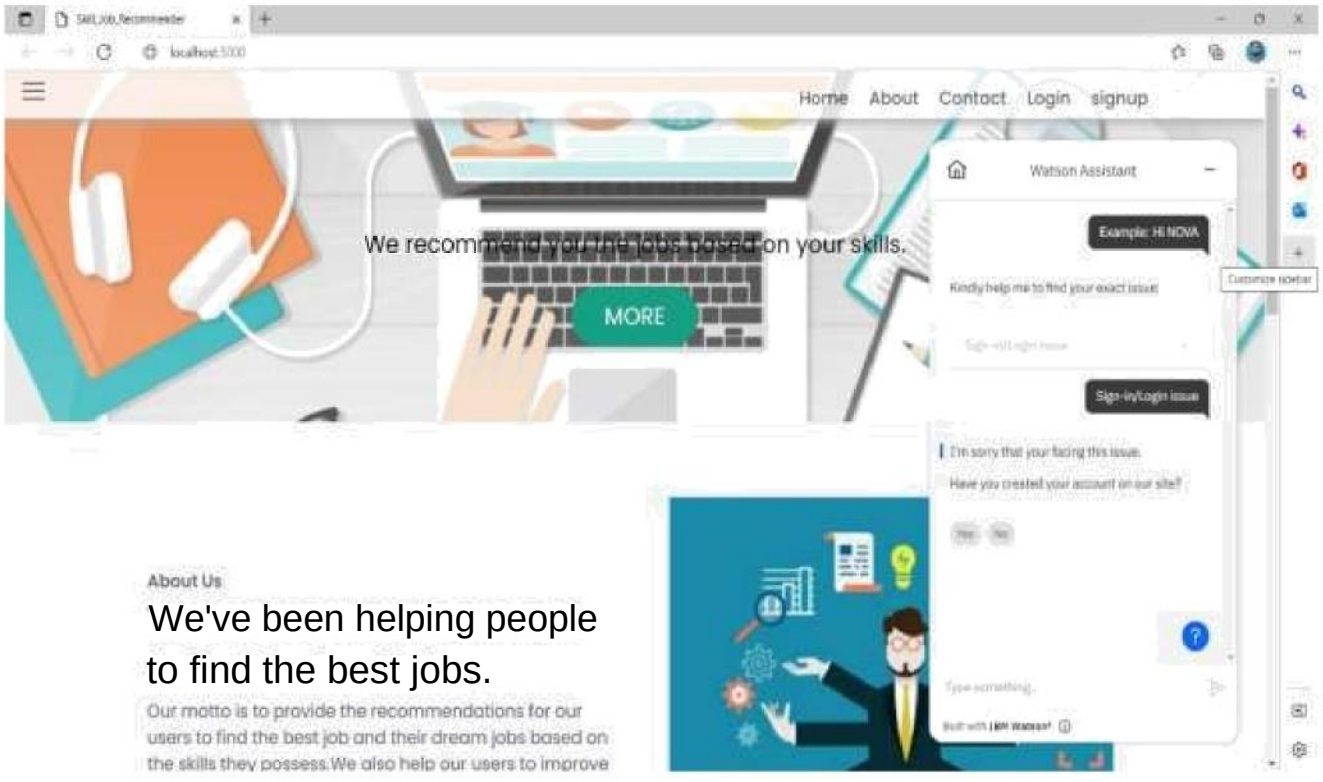
*"D tIKE TO CHAR AB"OUT



About Us

We've been helpingpeople to find the best jobs.

Our motto is to provide the recommendations for our users to find the best job and their dream jobs based on the skills they possess.We also help our users to improve



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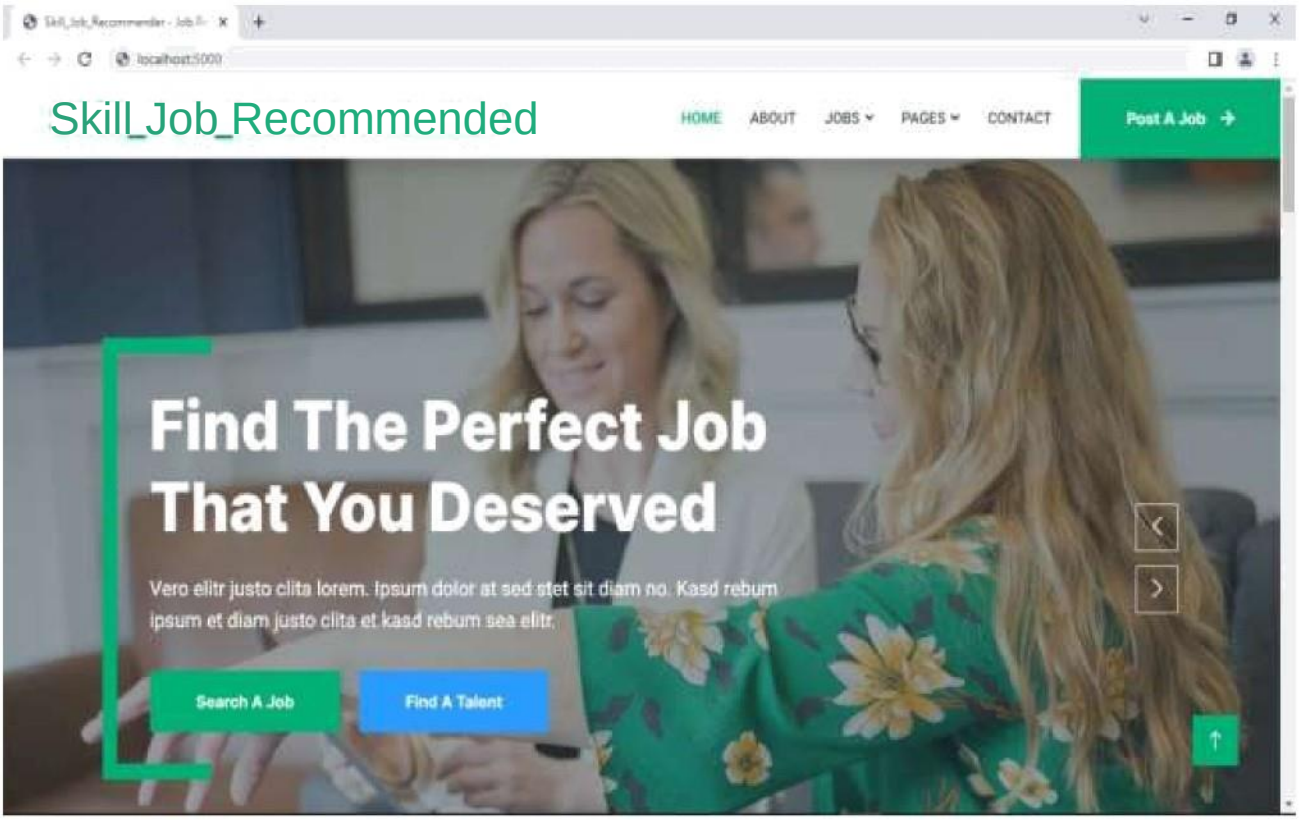
Skill_Job_Recommended
HOME
ABOUT
JOBS
PAGES
CONTACT
Post A Job
Find The Perfect Job
That You Deserved
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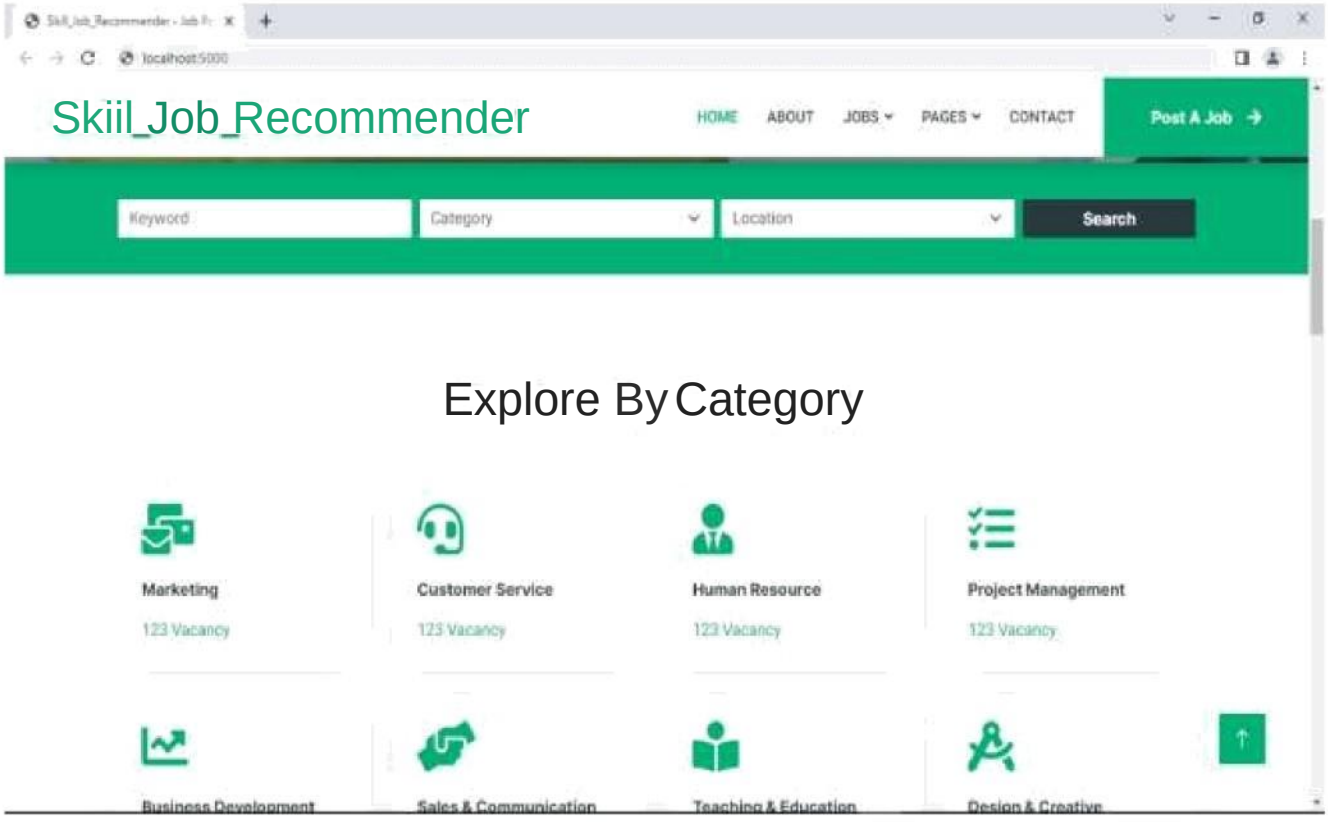
Search A Job
Find A Talent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HOME
ABOUT
JOBS
PAGES
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Post A Job
Keyword
Category
Location
Search
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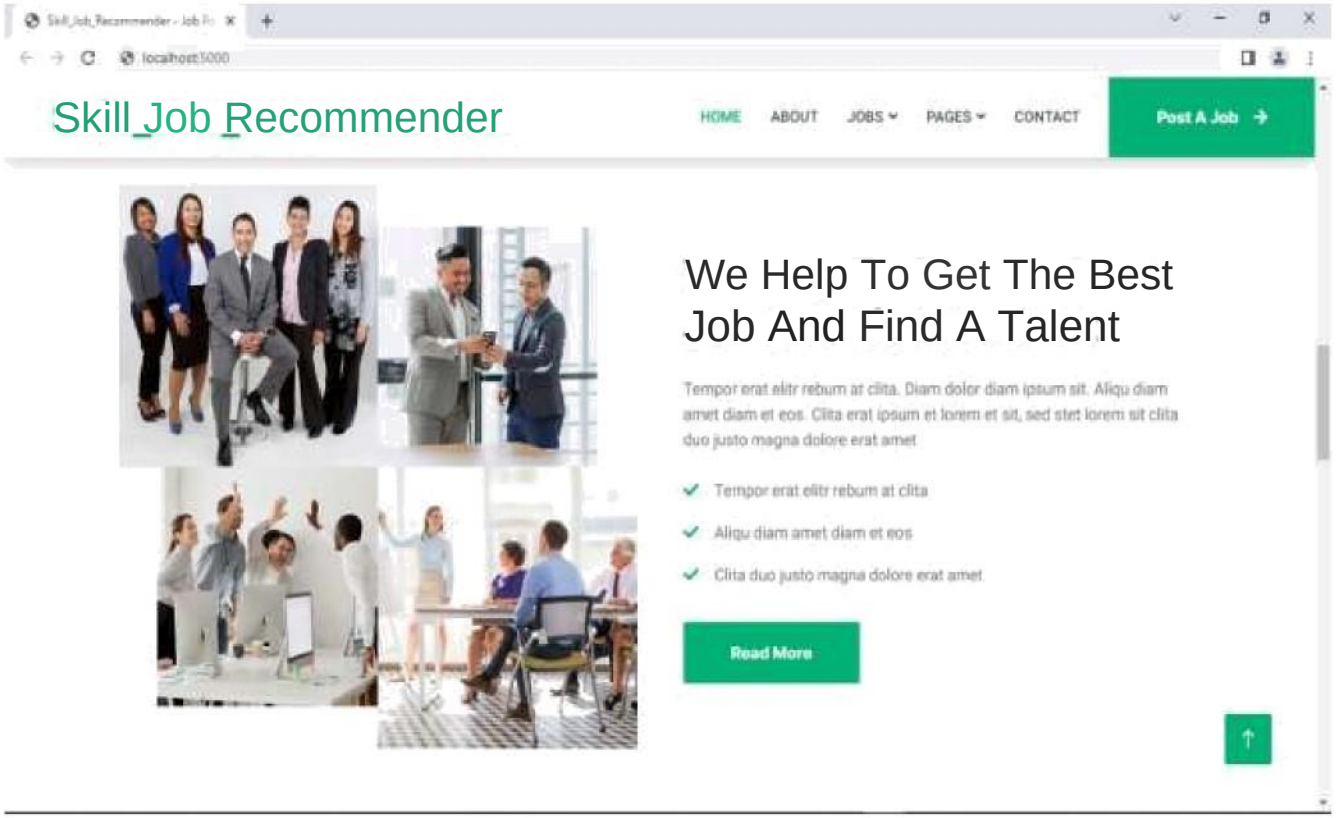
Business Development
Sales & Communication
Teaching & Education
Design & Creative


Skill Job Recommender
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Post A Job
We Help To Get The Best Job And Find A Talent
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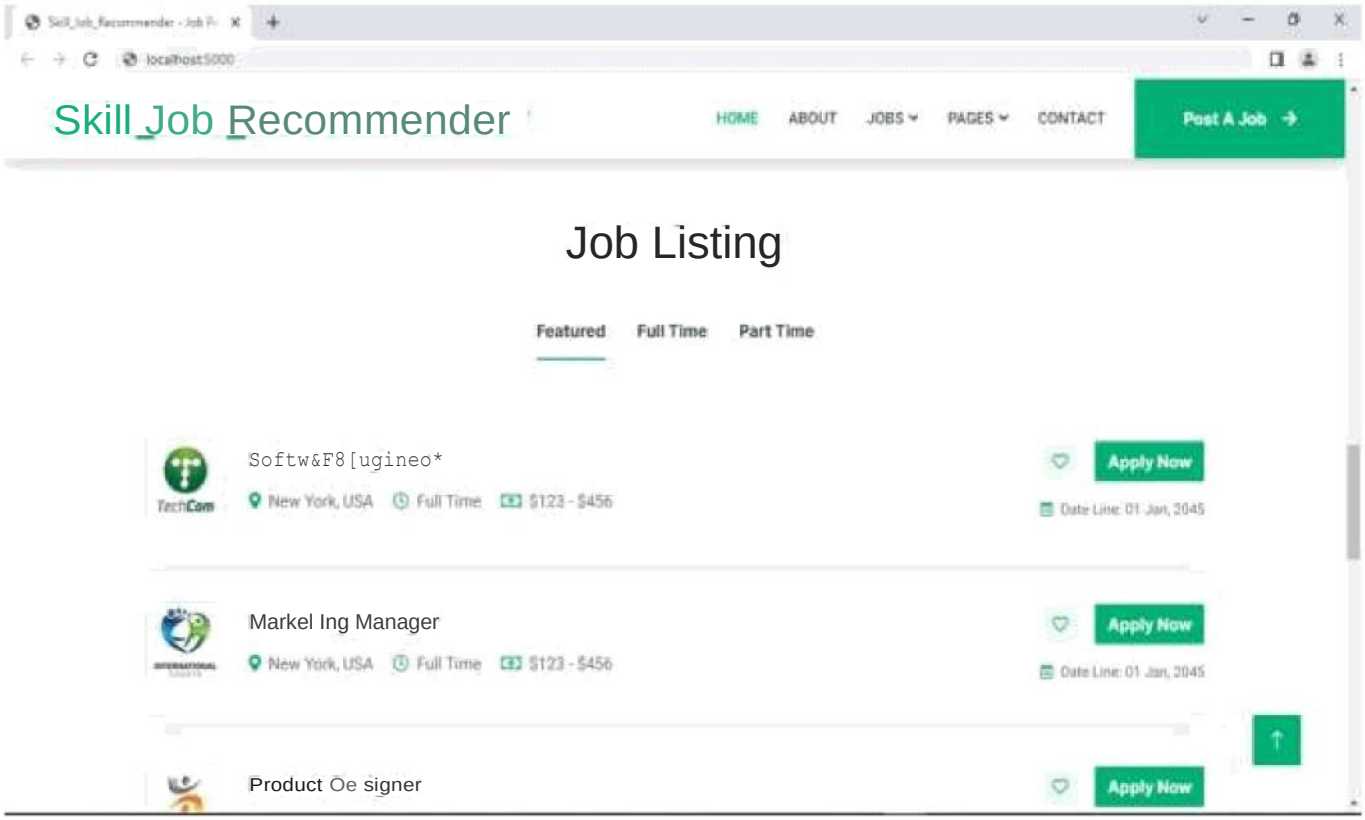
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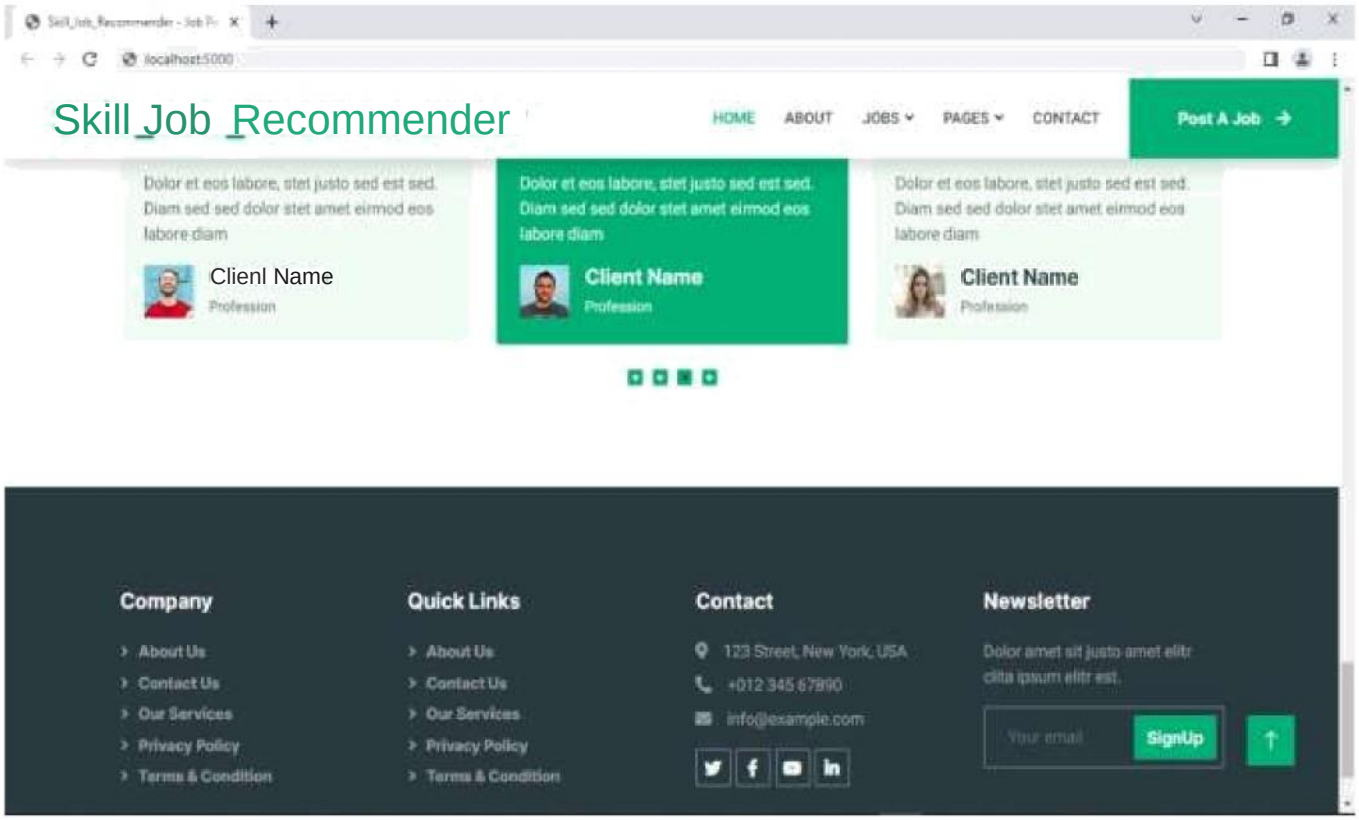
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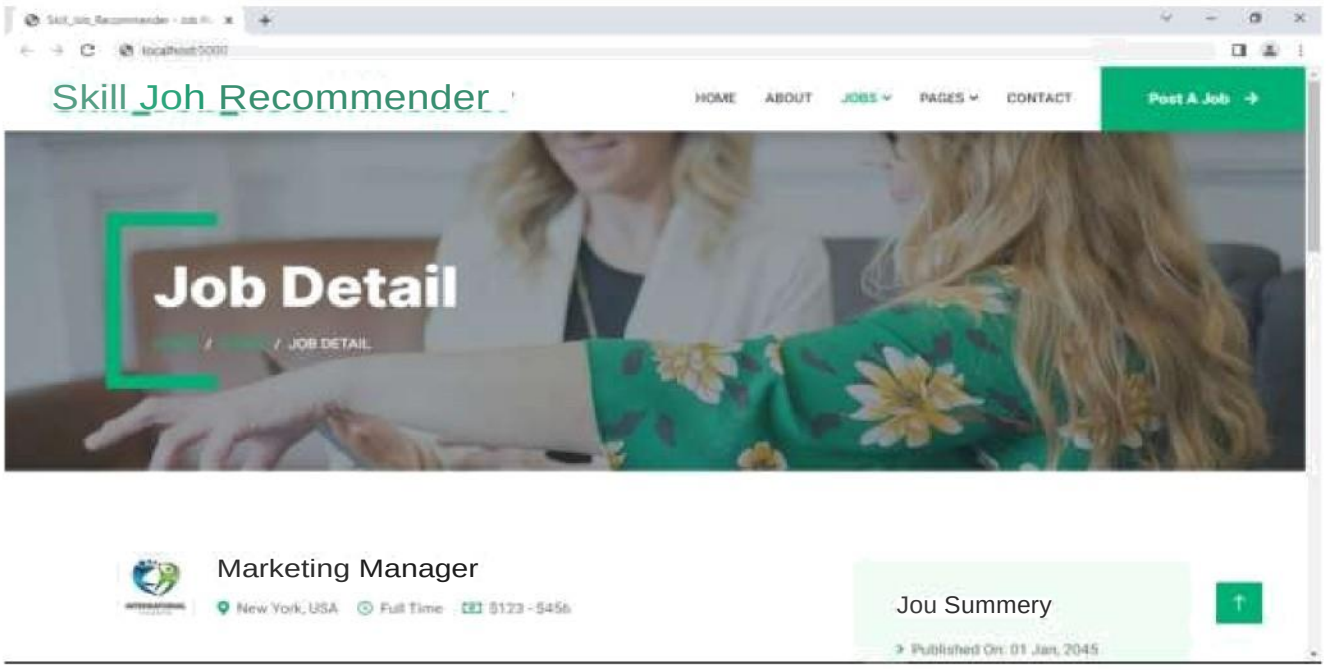
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Full Time
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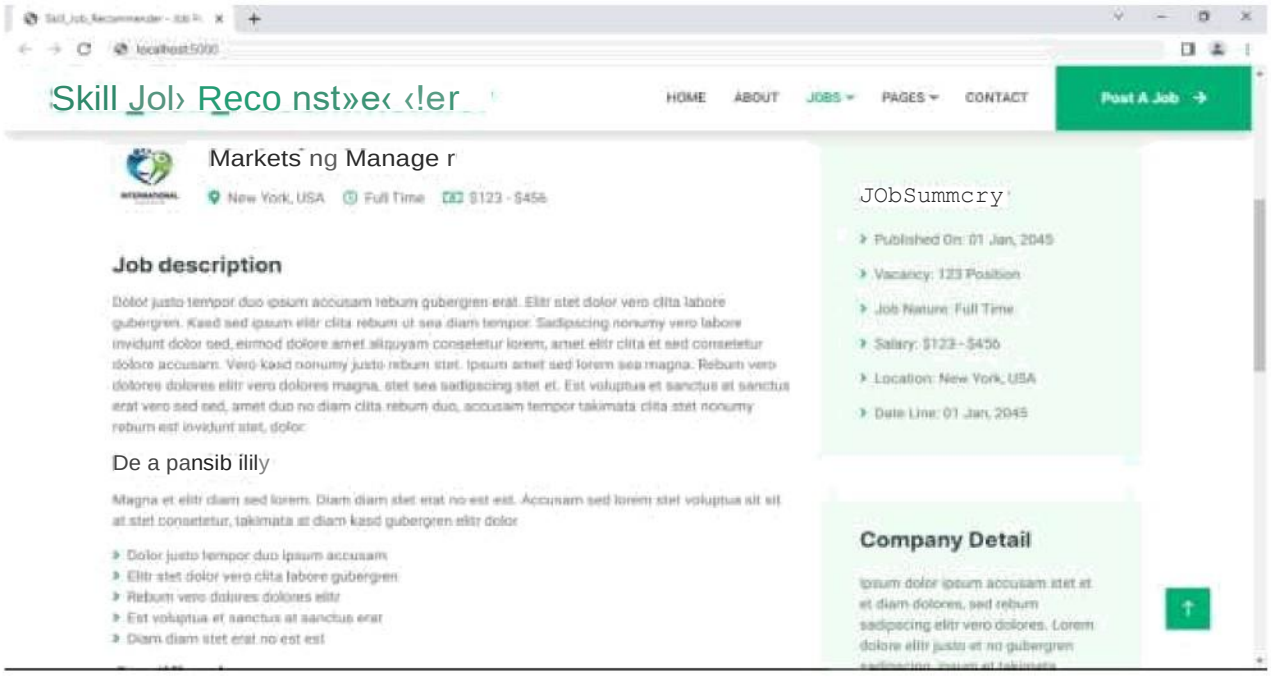
Jou Summery
Published On: 01 Jan, 2045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Published On: 01 Jan, 2045
Vacancy: 123 Position
Job Nature: Full Time
Salary: $123 - $456
Location: New York, USA
Date Line: 01 Jan, 2045
Company Detail
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1. ADVANTAGE AND DISADVANTAGE

❖ ADVANTAGE :

- It helps candidates to search the job which perfectly suites them and make them aware of all the job openings.
- It help recruiters of the company to choose the right candidates for their organisations with appropriate skills.
- Since it is cloud application , it does require any installation of softwares and is portable.

❖ DISADVANTAGE:

- It is costly.
- Uninterrupted internet connection is required for smooth functioning of application.

1. CONCLUSION

we have used ibm cloud services like db2, cloud registry , kubernetes , Watson assistant to create this application , which will be very usefull for candidates who are searching for job and as well as for the company to select the right candidate for their organization.

2. FUTURE SCOPE

Future directions of our work will focus on performing a more exhaustive evaluation considering a greater amount of methods and data as well as a comprehensive evaluation of the impact of each professional skill of a job seeker on the received job recommendation. We can use machine learning technicquesto recommend data in a efficient way.

3. APPENDIX

Source Code:

```
from turtle import st
from flask import Flask, render_template, request, redirect, url_for, session

import ibm_db
conn =
from flask_mail import Mail, Message


import ibm_boto3
from ibm_botocore.client import Config, ClientError

COS_ENDPOINT=
COS_API_KEY_ID=
COS_INSTANCE_CRN=


# Create resource https://s3.ap.cloud-object-storage.appdomain.cloud
cos = ibm_boto3.resource("s3",
    ibm_api_key_id=COS_API_KEY_ID,
    ibm_service_instance_id=COS_INSTANCE_CRN
    ,
```

```
    config=Config(signature_version="oauth"),
    endpoint_url=COS_ENDPOINT
)

app = Flask(_name_)

def multi_part_upload(bucket_name, item_name, file_path):
    try:
        print("Starting file transfer for {0} to bucket: {1}\n".format(item_name, bucket_name))
        # set 5 MB chunks
        part_size = 1024 * 1024 * 5

        # set threadhold to 15 MB
        file_threshold = 1024 * 1024 * 15

        # set the transfer threshold and chunk size transfer_config
        = ibm_boto3.s3.transfer.TransferConfig(
            multipart_threshold=file_threshold,
            multipart_chunksize=part_size
        )

        # the upload_fileobj method will automatically execute a multi-part upload#
        in 5 MB chunks for all files over 15 MB
        with open(file_path, "rb") as file_data:
            cos.Object(bucket_name, item_name).upload_fileobj(
                Fileobj=file_data,
                Config=transfer_config
            )

        print("Transfer for {0} Complete!\n".format(item_name))
    except ClientError as be:
        print("CLIENT ERROR:
    {0}\n".format(be))except Exception as e:
        print("Unable to complete multi-part upload: {0}".format(e))

@app.route('/uploadResume', methods = ['GET', 'POST'])
def upload():
   if request.method == 'POST':
        bucket='sv-demoibm1'
        name_file = session['username']
        name_file += '.png'
        filenameis = request.files['file']
        filepath = request.form['filepath']f
        = filepath
        f = f+filenameis.filename
        print("
        ",f
        )
        multi_part_upload(bucket,name_file,f)return
        redirect(url_for('dashboard'))
```

```
  if request.method == 'GET':
     return render_template('upload.html')


mail = Mail(app) # instantiate the mail class

app.config['MAIL_SERVER']='smtp.sendgrid.net'
app.config['MAIL_PORT'] = 465
app.config['MAIL_USERNAME'] = 'apikey'
app.config['MAIL_USE_TLS'] = False
app.config['MAIL_USE_SSL'] = True
mail = Mail(app)

@app.route('/')
def home():
   return redirect(url_for('signin'))

@app.route('/dashboard')
def dashboard():
   return render_template('dashboard.html')

@app.route('/userguide')
def userguide():
   return render_template('userguide.html')

@app.route('/addskill')
def addskill():
   skill1    =
   ""   skill2
   =         ""
   skill3    =
   ""
   user = session['username']
   sql = "SELECT * FROM ACCOUNTSKILL WHERE USERNAME = ?"
   stmt = ibm_db.prepare(conn, sql)
   ibm_db.bind_param(stmt,1,user)
   ibm_db.execute(stmt)
   skillres = ibm_db.fetch_assoc(stmt)
   if skillres:
      skill1                    =
      skillres['SKILL1']
      skill2                    =
      skillres['SKILL2']
      skill3                    =
      skillres['SKILL3']
      print(skillres)
      return                                          render_template('addSkill.html',
   skill1=skill1,skill2=skill2,skill3=skill3)else :
      return                                          render_template('addSkill.html',

skill1=skill1,skill2=skill2,skill3=skill3) @app.route('/editskill', methods =['GET',

'POST'])
```

```
def editskill():
    usernameskill = session['username']
    sql = "SELECT * FROM ACCOUNTSKILL WHERE USERNAME = ?"
    stmt = ibm_db.prepare(conn, sql)
    ibm_db.bind_param(stmt,1,usernameskill)
    ibm_db.execute(stmt)
    skillres = ibm_db.fetch_assoc(stmt)
    if skillres:
        msg = ""
        skill11 = request.form['skill1']
        skill21 = request.form['skill2']
        skill31 = request.form['skill3']
        print(skill11,"---",skill21,"--
        ",skill31)
        sql = "UPDATE ACCOUNTSKILL SET SKILL1 = ?, SKILL2 = ?, SKILL3 = ? WHERE USERNAME = ?;"
        stmt = ibm_db.prepare(conn, sql)
        ibm_db.bind_param(stmt,1,skill11)
        ibm_db.bind_param(stmt,2,skill21)
        ibm_db.bind_param(stmt,3,skill31)
        ibm_db.bind_param(stmt,4,usernameskill)
        print("::::::::::::::::::::::::::::::::::::",sql)
        ibm_db.execute(stmt)
        msg = "Saved Successfully !"
        return render_template('addSkill.html',msg = msg, skill1=skill11,skill2=skill21,skill3=skill31)
    else :
        msg = ""
        skill12                         =
        request.form['skill1']skill22 =
        request.form['skill2']skill32 =
        request.form['skill3']
        print("----------,",usernameskill )
        sql = "INSERT INTO ACCOUNTSKILL VALUES (?,?,?,?)"
        stmt = ibm_db.prepare(conn, sql)
        ibm_db.bind_param(stmt,1,usernameskill)
        ibm_db.bind_param(stmt,2,skill12)
        ibm_db.bind_param(stmt,3,skill22)
        ibm_db.bind_param(stmt,4,skill32)
        print("::::::::::::::::::::::::::::::::::::",sql)
        ibm_db.execute(stmt)
        msg = "Saved Successfully !"
        return render_template('addSkill.html',msg = msg, skill1=skill12,skill2=skill22,skill3=skill32)

@app.route('/jobmarket')
def jobmarket():
    jobids = []
    jobnames = []
    jobimages = []
    jobdescription = []

    sql = "SELECT * FROM JOBMARKET"
```

```
    stmt = ibm_db.prepare(conn, sql)
    username = session['username']
    print(username)
    #ibm_db.bind_param(stmt,1,username)
    ibm_db.execute(stmt)
    joblist = ibm_db.fetch_tuple(stmt)
    print(joblist)
    while joblist != False:
        jobids.append(joblist[0])
        jobnames.append(joblist[1])
        jobimages.append(joblist[2])
        jobdescription.append(joblist[3])
        joblist = ibm_db.fetch_tuple(stmt)

    jobinformation = []

    cols = 4
    size = len(jobnames)
    for i in range(size):
        col = []
        col.append(jobids[i])
        col.append(jobnames[i])
        col.append(jobimages[i])
        col.append(jobdescription[i])
        jobinformation.append(col)
    print(jobinformation)

    return render_template('jobmarket.html', jobinformation = jobinformation)

@app.route('/filterjobs')
def filterjobs():
    skill1 = ""
    skill2 = ""
    skill3 = ""
    user = session['username']
    sql = "SELECT * FROM ACCOUNTSKILL WHERE USERNAME = ?"
    stmt = ibm_db.prepare(conn, sql)
    ibm_db.bind_param(stmt,1,user)
    ibm_db.execute(stmt)
    skillres = ibm_db.fetch_assoc(stmt)
    if skillres:
        skill1                  =
        skillres['SKILL1']
        skill2                  =
        skillres['SKILL2']
        skill3                  =
        skillres['SKILL3']
        print(skillres)
        jobids = []
        jobnames = []
        jobimages =
        []
```

```
    jobdescription = []

    sql = "SELECT * FROM JOBMARKET"
    stmt = ibm_db.prepare(conn, sql) username
    = session['username'] print(username)
    #ibm_db.bind_param(stmt,1,username)
    ibm_db.execute(stmt)
    joblist = ibm_db.fetch_tuple(stmt)
    print(joblist)
    while joblist != False:
      jobids.append(joblist[0])
      jobnames.append(joblist[1])
      jobimages.append(joblist[2])
      jobdescription.append(joblist[3])
      joblist = ibm_db.fetch_tuple(stmt)

    jobinformation = []

    cols = 4
    size = len(jobnames)
    print("$$$$$$$$$$$$$$$$$$$$$$$$$$$$$4",skill1,skill2,skill3)

    for i in range(size):
      col = []

print("@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
@@@@@@@@@@@@@@@@",jobdescription[i])
      if jobdescription[i].lower() == skill1.lower() or jobdescription[i].lower() == skill2.lower() or
jobdescription[i].lower() == skill3.lower() :
        col.append(jobids[i])
        col.append(jobnames[i])
        col.append(jobimages[i])
        col.append(jobdescription[i])
        jobinformation.append(col)

print("@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
@@@@@@@@@@@@@@@@",jobinformation)

    return render_template('jobmarket.html', jobinformation = jobinformation)

@app.route('/signin', methods =['GET', 'POST'])
def signin():
  msg = ''
  if request.method == 'POST':
     username = request.form['username']
     password = request.form['password']
    sql = "SELECT * FROM ACCOUNT 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)

        if account:
           passCheck = "SELECT UPASSWORD FROM ACCOUNT WHERE username
           =?"stmt = ibm_db.prepare(conn, passCheck)
           ibm_db.bind_param(stmt,1,username)
           ibm_db.execute(stmt)
           result = ibm_db.fetch_assoc(stmt)
           passWordInDb =
           result["UPASSWORD"]if
           passWordInDb == password:
              session['loggedin'] = True
              #session['id'] =
              account['UID']
              session['username'] =
              account['USERNAME']msg = 'Logged in
              successfully !'
              return render_template('dashboard.html', msg = msg)
           else:
              msg = 'Incorrect username / password !'

        else:
           msg = 'Incorrect username / password !'
        ''' if account:
           session['loggedin'] = True
           session['id'] = account['id']
           session['username'] = account['username']
           msg = 'Logged in successfully !'
           return render_template('index.html', msg = msg) '''

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


def applyJob():
     print("----------Function Called")



@app.route('/profile', methods =['GET',
'POST'])def profile():
     user = session['username']
     sql = "SELECT * FROM ACCOUNT WHERE USERNAME = ?"
     stmt = ibm_db.prepare(conn, sql)
     ibm_db.bind_param(stmt,1,user)
     ibm_db.execute(stmt)
     account = ibm_db.fetch_assoc(stmt)
     usernameInUser =
     account['USERNAME']userPassword =
     account['UPASSWORD']
```

```
    userEmail = account['EMAILID']
    firstName =
    account['FIRSTNAME']lastName
    = account['LASTNAME']
    print(account)
    return render_template('profile.html',
usernameInUser=usernameInUser,userPassword=userPassword,userEmail=userEmail,firstName=firstNa
me,lastName=lastName)

@app.route('/editProfile', methods =['GET', 'POST'])
def editProfile():
    if request.method == 'POST':
        msg = ""
        username = request.form['usernameInUser']
        password = request.form['userPassword']
        email = request.form['userEmail']
        fname = request.form['firstName']
        lname = request.form['lastName']
        sql = "UPDATE ACCOUNT SET UPASSWORD = ?, EMAILID = ?, FIRSTNAME = ?,
LASTNAME = ? WHEREUSERNAME = ?;"
        stmt = ibm_db.prepare(conn, sql)
        ibm_db.bind_param(stmt,1,password)
        ibm_db.bind_param(stmt,2,email)
        ibm_db.bind_param(stmt,3,fname)
        ibm_db.bind_param(stmt,4,lname)
        ibm_db.bind_param(stmt,5,username)
        print("::::::::::::::::::::::::::::::::::::",sql)
        ibm_db.execute(stmt)
        msg = "Saved Successfully !"
        return render_template('profile.html', msg = msg,
usernameInUser=username,userPassword=password,userEmail=email,firstName=fname,lastName=lna
me)

@app.route('/logout')
def logout():
    session.pop('loggedin', None)
    session.pop('username', None)
    return redirect(url_for('signin'))

@app.route('/signup', methods =['GET',
'POST'])def signup():
    msg = ''
    if request.method == 'POST':
        username = request.form['username']
        password = request.form['password']
        email = request.form['email']
        fname = request.form['fname']
        lname = request.form['lname']
        sql = "SELECT * FROM ACCOUNT 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)

        if account:
            msg = 'Account already exists
        !'else:
            insert_sql = "INSERT INTO ACCOUNT VALUES (?,?,?,?,?)"
            prep_stmt = ibm_db.prepare(conn, insert_sql)
            ibm_db.bind_param(prep_stmt, 1, username)
            ibm_db.bind_param(prep_stmt, 2, password)
            ibm_db.bind_param(prep_stmt, 3, email)
            ibm_db.bind_param(prep_stmt, 4, lname)
            ibm_db.bind_param(prep_stmt, 5, fname)
            ibm_db.execute(prep_stmt)
            msg = 'Data inserted successfully'
    return render_template('signup.html', msg = msg)


@app.route('/jobapplied/<int:jobid>')
def jobappliedFunction(jobid):
    jobid = jobid
    sql = "SELECT JOBCOMPANY FROM JOBMARKET WHERE JOBID =?"
    stmt = ibm_db.prepare(conn, sql)
    ibm_db.bind_param(stmt,1,jobid)
    ibm_db.execute(stmt)
    result = ibm_db.fetch_assoc(stmt)
    jobname                                =
    result['JOBCOMPANY']
    sql = "SELECT COMPANY_EMAIL FROM JOBMARKET WHERE JOBID =?"
    stmt = ibm_db.prepare(conn, sql)
    ibm_db.bind_param(stmt,1,jobid)
    ibm_db.execute(stmt)
    result = ibm_db.fetch_assoc(stmt)
    jobemail =
    result['COMPANY_EMAIL']
    print("-----JOB APPLIED-----",jobid)
    return render_template('fillapplication.html',jobid = jobid, jobname = jobname, jobemail = jobemail)


@app.route('/appliedjob', methods =['GET', 'POST'])
def appliedjob():
    username = session['username']
    passCheck = "SELECT EMAILID FROM ACCOUNT WHERE username
    =?"stmt = ibm_db.prepare(conn, passCheck)
    ibm_db.bind_param(stmt,1,username)
    ibm_db.execute(stmt)
    result = ibm_db.fetch_assoc(stmt)
    fromEmail = result["EMAILID"]
```

```
    msgcontent = request.form['reasoncontent']
    emailJob = request.form['jobEmailForm']
    portfolioLink = request.form['portfolio']
    city = request.form['citypreffered']
    appliedJobId = request.form['appliedJobId']
    print("----------------------",appliedJobId)
    insert_sql = "INSERT INTO APPLIEDJOBS VALUES (?,?)"
    prep_stmt = ibm_db.prepare(conn, insert_sql)
    ibm_db.bind_param(prep_stmt, 1, username)
    ibm_db.bind_param(prep_stmt, 2, int(appliedJobId))
    ibm_db.execute(prep_stmt)

    msg = Message('Hello',sender = fromEmail,recipients = [emailJob])
    msg.body = "Applicant Email : " + fromEmail + "\n" + "\nAbout Me : \n" + msgcontent + "\n"
+"\nPortfolio Link : " + portfolioLink + "\n" + "\nPreffered City : " + city
    mail.send(msg)
    return redirect(url_for('jobsapplied'))


@app.route('/jobsapplied')
def jobsapplied():
    jobids1 = []
    jobinformation = []

    sql = "SELECT * FROM APPLIEDJOBS WHERE USERNAME = ?"
    stmt = ibm_db.prepare(conn, sql)
    username = session['username']
    print(username)
    ibm_db.bind_param(stmt,1,username)
    ibm_db.execute(stmt)
    joblist = ibm_db.fetch_tuple(stmt)
    print(joblist)
    while joblist != False:
        print(".....",joblist)
        jobids1.append(joblist[1])
        joblist = ibm_db.fetch_tuple(stmt)

    print(jobids1)
    for x in range(len(jobids1)):
        jobids = []
        jobnames = []
        jobimages = []
        jobdescription = []

        print("nnnnnnnnnnnnnnnnnnnnnnnnnnn",len(jobids1))
        sql = "SELECT * FROM JOBMARKET WHERE
        JOBID = ?"
        stmt = ibm_db.prepare(conn, sql)
        ibm_db.bind_param(stmt,1,jobids1[x])
```

```
        print("xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx: ",jobids1[x])
        ibm_db.execute(stmt)
        joblist = ibm_db.fetch_tuple(stmt)
        print(">>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>",joblist)
        while joblist != False:
            jobids.append(joblist[0])
            jobnames.append(joblist[1])
            jobimages.append(joblist[2])
            jobdescription.append(joblist[3])
            joblist = ibm_db.fetch_tuple(stmt)
        cols = 4
        size = len(jobnames)
        for i in range(size):
            col = []
            col.append(jobids[i])
            col.append(jobnames[i])
            col.append(jobimages[i])
            col.append(jobdescription[i])
            print("CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCcc",co
            l)
            jobinformation.append(col)
            print(jobinformation)


    print("//////////////////////////////////////////////",jobinformation)

    return render_template('appliedjobs.html', jobinformation = jobinformation)

#00C1AB
```

GitHub & Project Demo Link:

https://github.com/IBM-EPBL/IBM-Project-141-1658213226