

# **JOB RECOMMENDATION SYSTEM**

## **A PROJECT REPORT**

*Submitted by*

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*in partial fulfillment for the award of the degree*

*of*

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**ANNA UNIVERSITY, CHENNAI**

**MAY 2024**

**RAJALAKSHMI ENGINEERING COLLEGE  
CHENNAI  
BONAFIDE CERTIFICATE**

Certified that this Thesis titled “**JOB RECOMMENDATION SYSTEM**” is the bonafide work of “ **AKALYA G (2116210701021) , ARAVIND S (2116210701033)** ” who carried out the work under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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# **ABSTRACT**

In today's dynamic job market, career guidance plays a pivotal role in aligning individuals with suitable employment opportunities and fostering their professional growth. Leveraging advancements in technology, this project aims to develop a skill/job recommender application to transform career guidance by utilizing AI methodologies and open-source data.

The application operates as a web platform that engages users through a series of questions to assess their knowledge and skills. Additionally, it incorporates a module powered by UiPath automation to extract skillsets from user resumes, enhancing the accuracy of recommendations.

The core functionality of the application lies in its AI-driven job recommendation engine, which matches users with suitable career paths based on their skills, interests, and market demand.

Furthermore, the application provides curated links to educational resources, notes, and websites to empower users with relevant knowledge and skills necessary for their chosen career paths. To enhance user experience and provide personalized assistance, the application also integrates a chatbot feature, enabling direct interaction with skilled professionals for guidance and advice.

By leveraging technology to streamline the career exploration and job search process, this project aims to empower aspiring youth with the tools and resources needed to make informed decisions and pursue meaningful career opportunities.

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# **CHAPTER 1**

## **INTRODUCTION**

In response to the evolving landscape of employment, this project introduces a groundbreaking skill/job recommender application aimed at revolutionizing career guidance and job matching. Leveraging artificial intelligence (AI) methodologies and open-source data, the application represents a paradigm shift in how individuals explore career options and embark on their professional journeys.

Furthermore, the application incorporates UiPath automation technology to extract skillsets from user resumes with precision, enhancing the accuracy of job recommendations. It also serves as a knowledge hub, providing curated links to educational resources, notes, and websites relevant to users' chosen career paths, empowering them with the knowledge and skills needed to thrive.

The application features a chatbot for direct interaction between users and skilled professionals, offering real-time support, mentorship, and advice. This fosters a supportive community of learners and professionals, enhancing the user experience and facilitating personalized guidance.

In summary, this project harnesses the power of AI, open-source data, and automation to transform career guidance and job matching, facilitating efficient employment and career development in the digital age. By providing individuals with personalized recommendations, access to educational resources, and direct interaction with professionals, the application empowers users to make informed decisions and pursue rewarding career opportunities.

## **1.1 PROBLEM STATEMENT**

Traditional career guidance lacks personalization and access to relevant information, hindering efficient job matching and interaction with professionals. The project aims to address these challenges by developing a skill/job recommender application that leverages AI, open-source data, and automation for personalized guidance and career development.

## **1.2 SCOPE OF THE WORK**

The project involves creating a skill/job recommender application using AI, open-source data, and automation. It includes user assessment modules, UiPath automation for resume skill extraction, job recommendation algorithms, and a curated knowledge hub. The application will also feature a chatbot for direct interaction with professionals. Testing, feedback integration, and iterative improvements are part of the scope.

## **1.3 AIM AND OBJECTIVES OF THE PROJECT**

The aim of the project is to revolutionize career guidance and job matching by developing a skill/job recommender application. Leveraging AI, open-source data, and automation, the objective is to provide personalized recommendations tailored to individual skills and interests. The application seeks to streamline the job search process, offering access to curated educational resources and facilitating direct interaction with professionals for mentorship and advice.

By empowering users with the tools and insights needed for informed decision-making, the project aims to foster efficient employment and career development, ultimately enhancing opportunities for personal and professional growth .



## **CHAPTER 2**

### **LITRETURE SURVEY**

The field of career guidance and job matching has seen significant advancements propelled by the integration of artificial intelligence (AI) methodologies. Studies such as Kulkarni et al. (2019) have demonstrated the potential of AI-driven systems in providing personalized career recommendations.

These systems leverage machine learning algorithms to analyze individual skills, preferences, and market trends, thus aiding in the identification of suitable job opportunities aligned with users' profiles and career aspirations. Such AI-driven solutions offer a more efficient and tailored approach to career guidance, enabling individuals to make informed decisions about their professional trajectories.

Open-source data has emerged as a valuable resource for enhancing job matching algorithms and techniques. Research by Yang et al. (2018) illustrates the effectiveness of leveraging open-source data sources, such as job postings and social media profiles, to improve the accuracy and relevance of job recommendations.

By tapping into publicly available data, researchers have developed innovative approaches for matching individuals with suitable employment opportunities, thus addressing the challenge of information asymmetry in the job market. This utilization of open-source data underscores the importance of leveraging external sources to enrich the job matching process. Automation technologies, particularly robotic process automation (RPA), have played a pivotal role

Sharma et al. (2020) demonstrate the utility of UiPath automation for extracting key skills and qualifications from resumes, thereby enhancing the efficiency and accuracy of job matching algorithms.

By automating labor-intensive tasks associated with resume analysis, RPA technologies enable faster and more reliable assessment of candidates' qualifications, ultimately leading to more precise job recommendations. This integration of automation streamlines processes and improves the overall effectiveness of job matching systems.

Personalization is paramount in effective career guidance, as individuals possess unique skills, interests, and aspirations. Research by Amado et al. (2017) underscores the importance of tailoring career recommendations to individual preferences and goals. AI-driven systems that adapt to users' evolving needs can provide more relevant and personalized guidance, leading to greater user satisfaction and improved job matches. By incorporating user feedback and preferences into the recommendation process, these systems become more adaptive and responsive to users' needs, ultimately enhancing the quality of job matches.

In summary, the literature survey highlights the transformative potential of AI, open-source data, automation, and personalized approaches in enhancing career guidance and job matching. By synthesizing insights from these studies, we aim to develop a skill/job recommender application that leverages the latest advancements in technology to empower individuals with the tools and resources needed for successful career development.

## CHAPTER 3

### SYSTEM DESIGN

#### 3.1 GENERAL

In this section, we would like to show how the general outline of how all the components end up working when organized and arranged together. It is further represented in the form of a flow chart in Fig 3.1.

#### 3.2 SYSTEM ARCHITECTURE DIAGRAM and USE CASE DIAGRAM

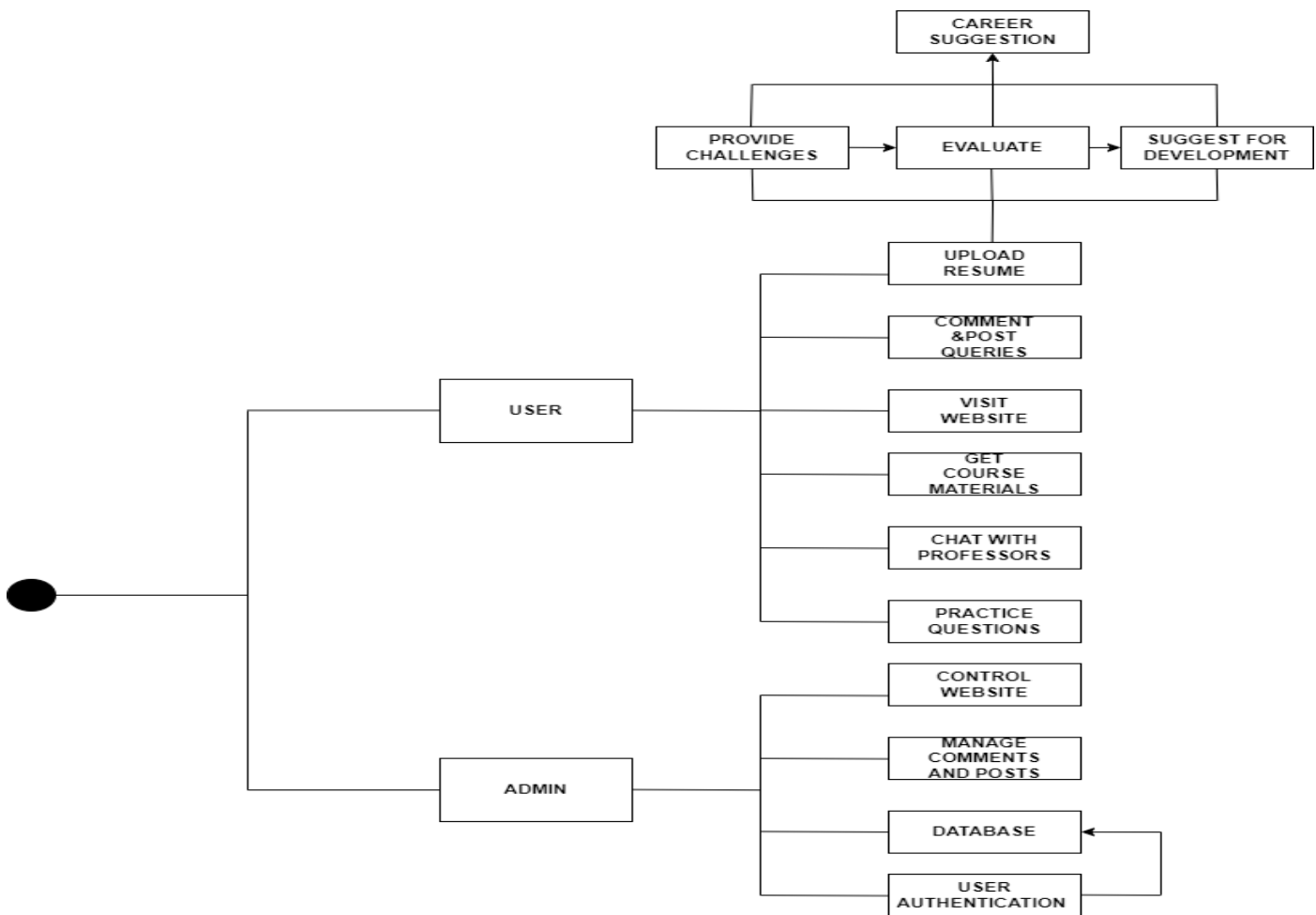


Fig 3.1 System Architecture

### 3.3 DEVELOPMENTAL ENVIRONMENT

#### 3.2.1 HARDWARE REQUIREMENTS.

COMPONENTS	SPECIFICATION
PROCESSOR	INTEL CORE i3
RAM	4 GB RAM
GPU	INBUILT GPU
MONITOR	15" COLOR
HARD DISK	512 GB
PROCESSOR SPEED	MINIMUM 1.1 GHz

**Table 3.1 Requirements**

#### 3.2.2 SOFTWARE REQUIREMENTS

The software requirements document is the specifications of the system. It should include both a definition and a specification of requirements. It is a set of what the system should rather be doing than focus on how it should be done. The software requirements provide a basis for creating the software requirements specification.

It is useful in estimating the cost, planning team activities, performing tasks, tracking the team, and tracking the team's progress throughout the development activity.

**Visual Studio** , and **chrome** would all be required.

## **CHAPTER 4**

### **PROJECT DESCRIPTION**

#### **4.1 METHODOLOGY**

The methodology for developing the skill/job recommender application encompasses a systematic approach that integrates various technologies and processes. Initially, the project kicks off with a comprehensive analysis of user requirements and market dynamics to identify key features and functionalities. Stakeholder consultations, user surveys, and market research contribute to this phase, ensuring a clear understanding of user preferences and career aspirations.

Subsequently, relevant data sources, including job postings, resumes, and educational resources, are collected and preprocessed to prepare them for analysis and integration into the application. This involves cleaning, formatting, and standardizing the data to ensure consistency and reliability.

The core of the application lies in the development of recommendation algorithms, which are trained using machine learning techniques. These algorithms analyze user profiles, job descriptions, and market trends to generate personalized recommendations for users. Collaborative filtering, content-based filtering, and hybrid models are among the methodologies employed to match users with suitable job opportunities.

Additionally, UiPath automation technology is utilized to streamline the process of resume analysis and skill extraction. UiPath robots are trained to extract key skills, qualifications, and experience from user resumes with precision.

The integration and development phase involve bringing together the recommendation algorithms, UiPath automation scripts, and other components into a cohesive web platform. Modern web development frameworks and technologies are employed to ensure scalability, reliability, and user-friendliness. The user interface is designed to be intuitive and accessible, enabling seamless navigation and interaction for users. Rigorous testing is conducted to identify and rectify any bugs, errors, or usability issues before deployment.

User acceptance testing (UAT) is carried out to gather feedback from target users and stakeholders, ensuring that the application meets their needs and expectations. Performance testing is also conducted to assess the scalability and responsiveness of the application under varying load conditions. Once testing is complete, and the application meets quality standards, it is deployed to production environments for public access. Continuous monitoring and maintenance activities are undertaken to ensure the smooth operation of the application, with updates, patches, and new features rolled out based on user feedback and evolving market trends.

The development of the skill/job recommender application follows a systematic approach starting with a thorough analysis of user requirements and market dynamics through stakeholder consultations, surveys, and research. Data from job postings, resumes, and educational resources is collected and preprocessed. Machine learning algorithms, including collaborative filtering and hybrid models, are developed to provide personalized job recommendations. UiPath automation enhances resume analysis for skill extraction. The application is built using modern web technologies for scalability and user-friendliness, followed by rigorous testing, user acceptance testing, and performance testing.

## 4.2 MODULE DESCRIPTION

**User Assessment Module:** This module is designed to gather information from users through a series of questions and assessments to evaluate their knowledge, skills, interests, and career preferences. It utilizes interactive forms or quizzes to collect relevant data, which serves as input for the recommendation algorithms.

**Resume Analysis Module:** Leveraging UiPath automation technology, this module automates the process of resume analysis and skill extraction. UiPath robots are trained to extract key skills, qualifications, and experience from user resumes uploaded to the platform. The extracted data is then used to augment the user's profile and enhance the accuracy of job recommendations.

**Recommendation Engine:** The recommendation engine is the heart of the application, responsible for generating personalized job recommendations based on user profiles and market demand (fig5.3and 5.4). It employs machine learning algorithms, such as collaborative filtering and content-based filtering, to match users with suitable job opportunities. The engine continuously learns from user interactions and feedback to improve the relevance and accuracy of recommendations over time.

**Knowledge Hub:** This module serves as a repository of curated educational resources, notes, and websites relevant to users' chosen career paths. It provides links to online courses, articles, tutorials, and other learning materials to help users acquire new skills and knowledge essential for their career development. The knowledge hub is continuously updated with the latest resources to ensure

relevance and usefulness.

**Chatbot Integration:** The chatbot module enables direct interaction between users and skilled professionals for personalized guidance and support. Using natural language processing (NLP) techniques, the chatbot can answer user queries, provide recommendations, and offer advice on career-related topics. It acts as a virtual mentor, facilitating real-time conversations and fostering a supportive community of learners and professionals.

**User Dashboard:** The user dashboard provides users with a personalized view of their profile, job recommendations, progress, and other relevant information. It offers insights into their skills, strengths, and areas for improvement, empowering them to make informed decisions about their career paths.

The dashboard may also include features such as job application tracking, goal setting, and progress monitoring to facilitate career development.

**Admin Panel:** The admin panel allows administrators to manage user data, content, and settings within the application. It provides tools for user management, content moderation, analytics, and reporting. Administrators can monitor user activity, track application performance, and make data-driven decisions to optimize the platform's effectiveness and user experience.

Additionally, the admin panel may include features for content curation, customization, and configuration to adapt the application to changing needs and preferences.

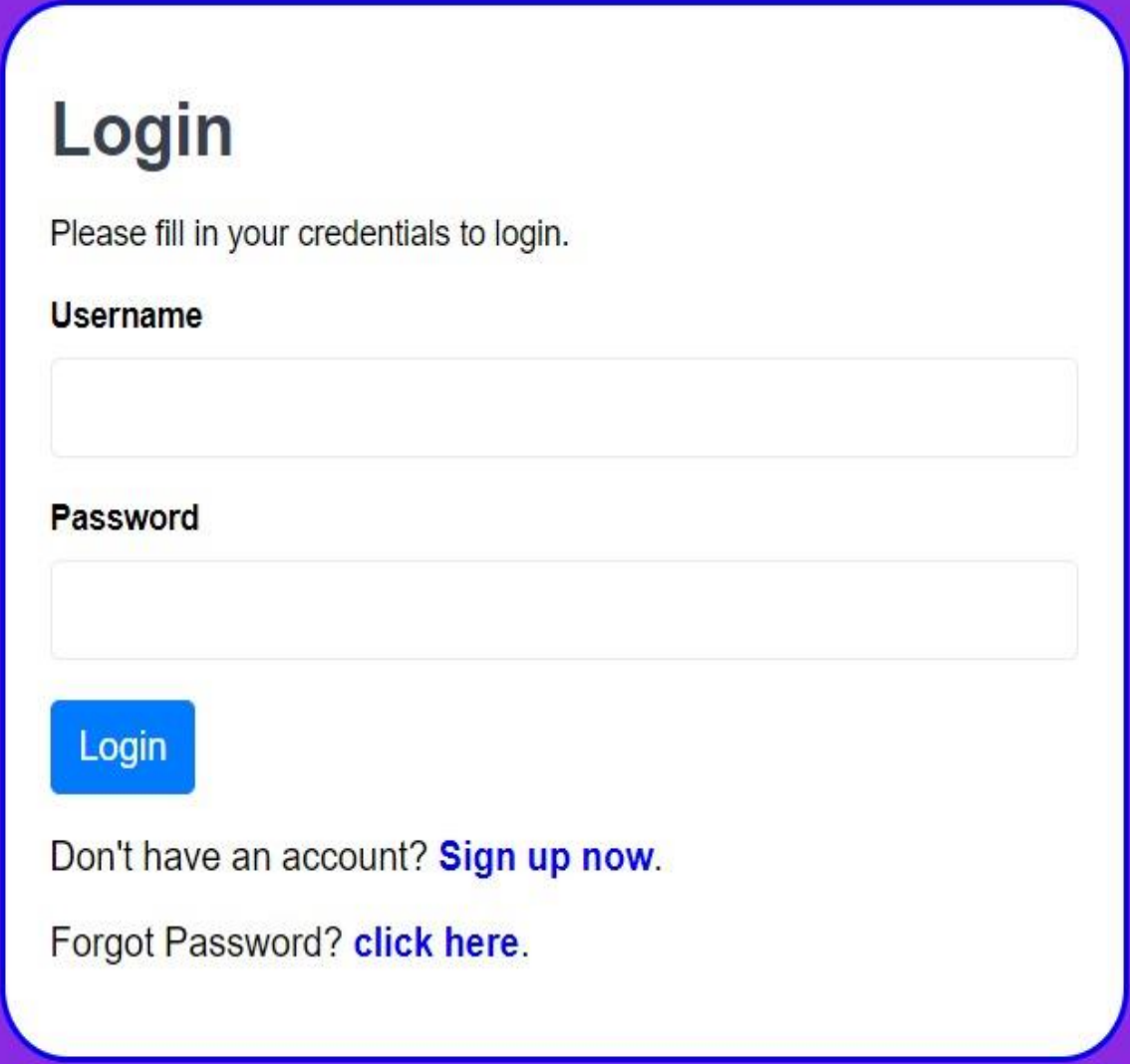


## CHAPTER 5

### RESULTS AND DISCUSSIONS

#### 5.1 OUTPUT

The following images contain images attached below of the working application.



**Login**

Please fill in your credentials to login.

**Username**

**Password**

**Login**

Don't have an account? [Sign up now.](#)

Forgot Password? [click here.](#)

Fig 5.1 Login

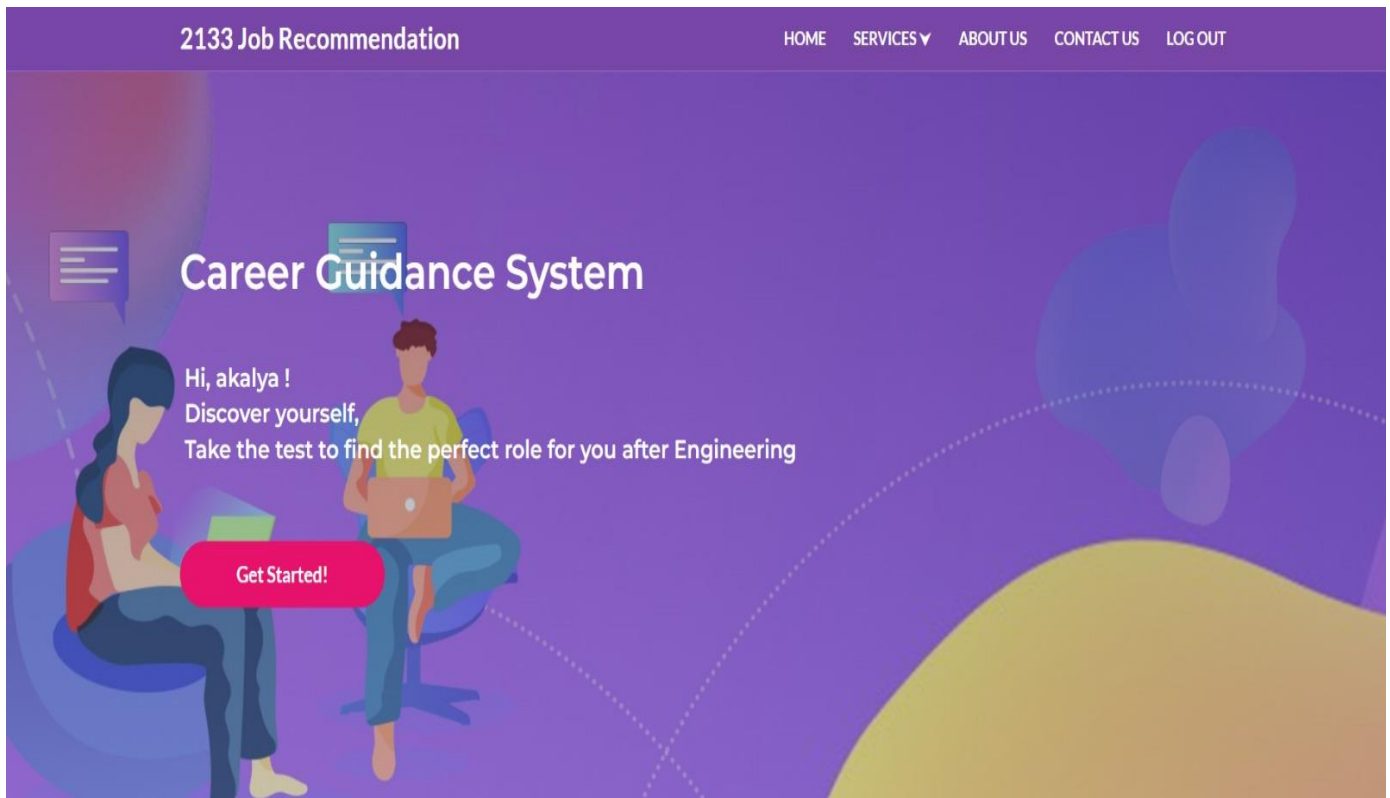
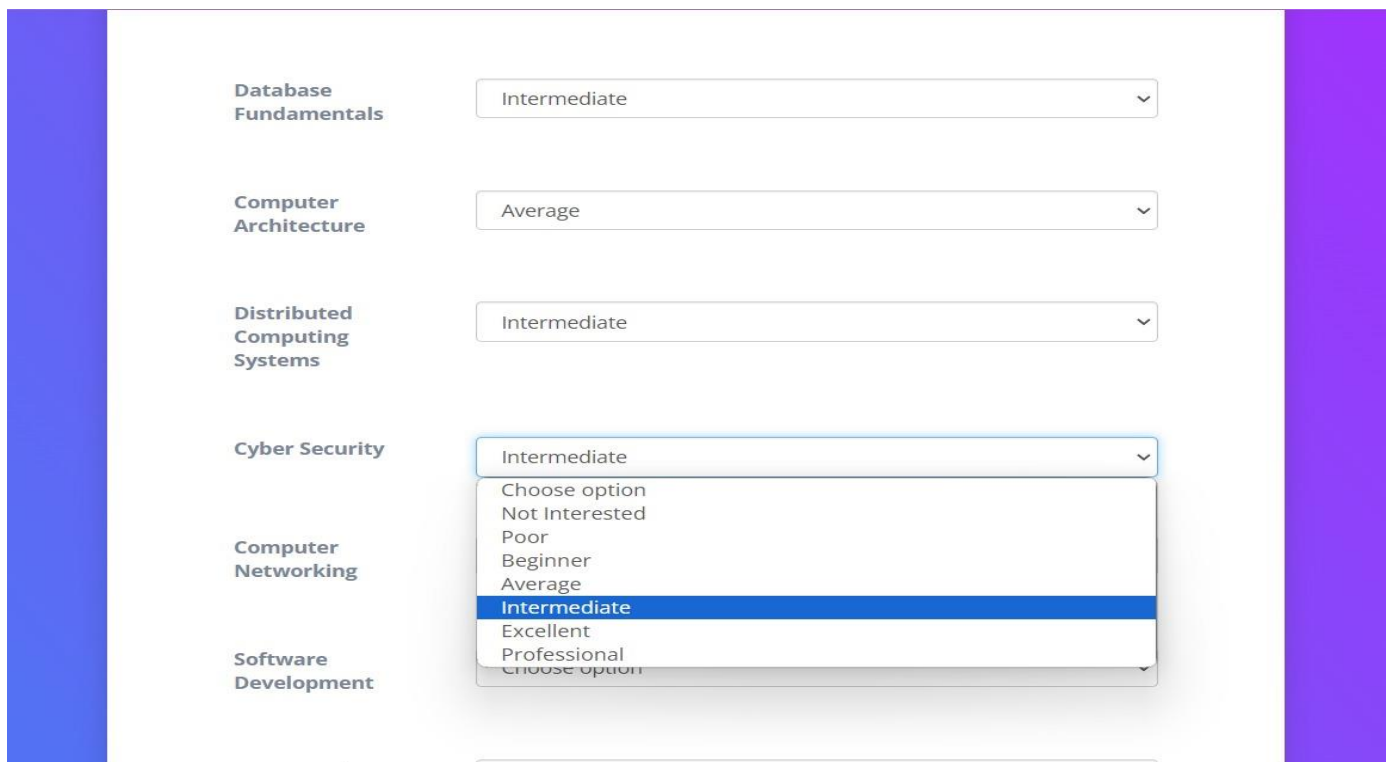


Fig 5.2 Home Page

The image displays the "Career Prediction" page. The header is identical to the home page. Below the header, a breadcrumb trail reads "Services / Career Prediction". The main heading is "Get Started to Discover Yourself!". The central part of the page features a white box with a purple header that says "RATE YOURSELF.....!!". Inside this box, there are three rows, each with a subject name on the left and a dropdown menu on the right. The subjects are "Database Fundamentals", "Computer Architecture", and "Distributed Computing Systems". Each dropdown menu currently displays the text "Choose option" and has a small downward arrow icon.

Fig 5.3 Career Prediction



A screenshot of a web form titled "Interest Selection". The form contains six rows, each with a skill category on the left and a dropdown menu on the right. The categories are: Database Fundamentals, Computer Architecture, Distributed Computing Systems, Cyber Security, Computer Networking, and Software Development. The dropdown menus show various skill levels: "Intermediate" for Database Fundamentals, "Average" for Computer Architecture, "Intermediate" for Distributed Computing Systems, and "Intermediate" for Cyber Security. The "Computer Networking" dropdown is open, showing options: "Choose option", "Not Interested", "Poor", "Beginner", "Average", "Intermediate" (highlighted in blue), "Excellent", "Professional", and "Choose option". The "Software Development" dropdown is also open, showing "Choose option" and "Choose option".

Category	Selected Option
Database Fundamentals	Intermediate
Computer Architecture	Average
Distributed Computing Systems	Intermediate
Cyber Security	Intermediate
Computer Networking	Intermediate
Software Development	Choose option

Fig 5.4 Interest Selection

Hey! The top job roles that matched your skills.....

You can be a great:



*To know more about these job roles click here!*

Fig 5.5 Result

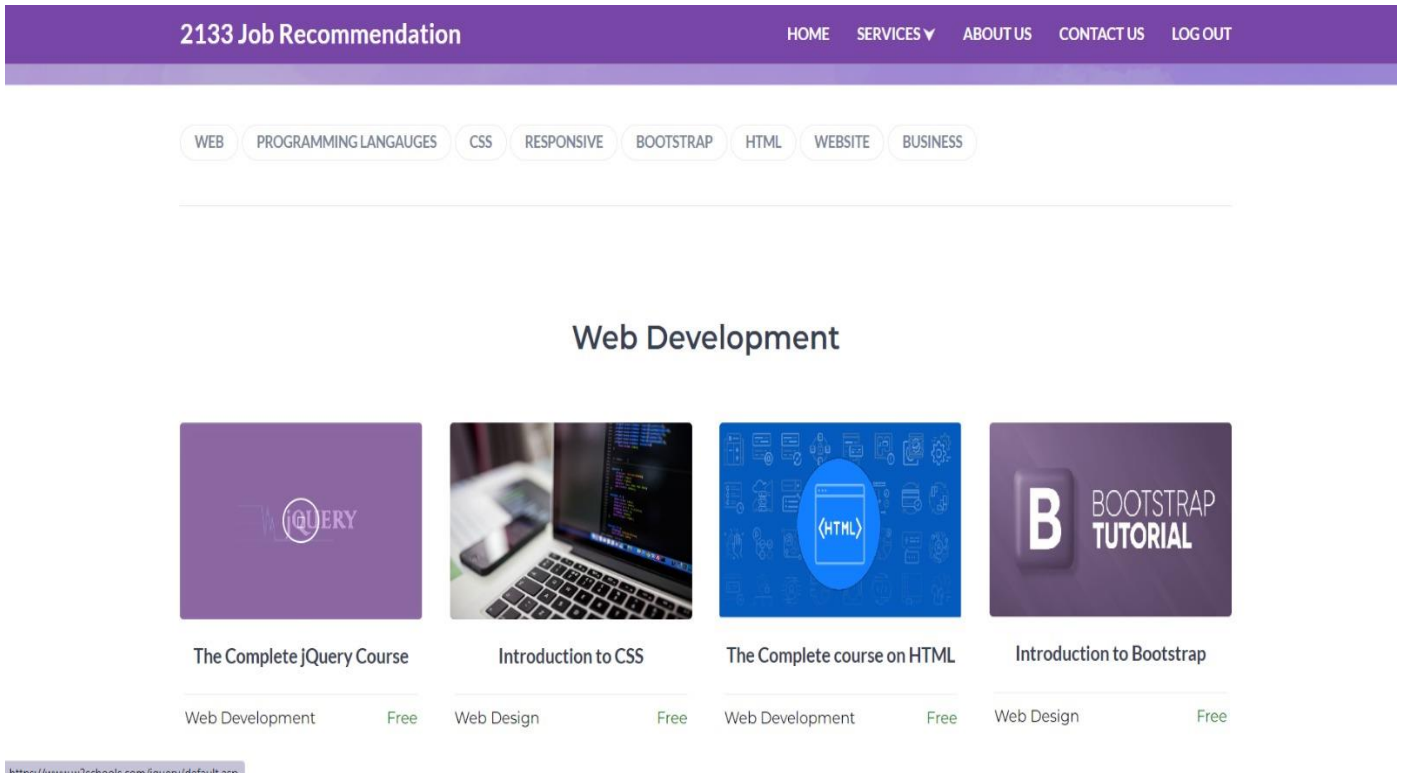


Fig 5.6 Resource materials

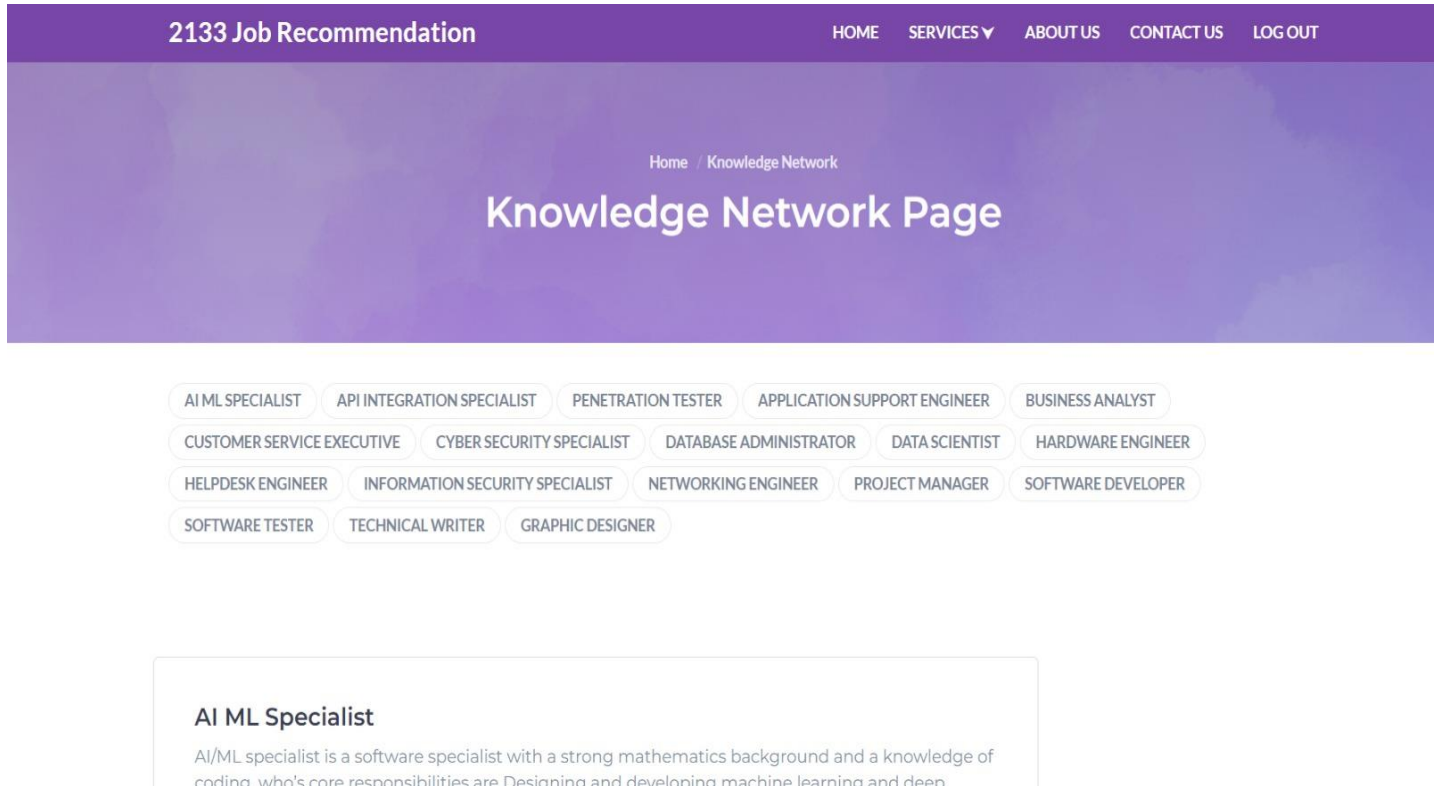


Fig 5.7 Knowledge Network

## **CHAPTER 6**

### **CONCLUSION AND FUTURE ENHANCEMENT**

#### **6.1 CONCLUSION**

In conclusion, the development of the skill/job recommender application marks a significant milestone in modernizing career guidance and job matching processes. By leveraging advanced technologies such as AI, open-source data, automation, and personalized guidance, the application empowers individuals with the tools and resources needed to navigate the complexities of the job market effectively. Through personalized job recommendations, access to curated educational resources(as in fig5.6), and interactive support mechanisms, the application facilitates efficient employment and fosters continuous learning and professional growth. Overall, the project demonstrates the transformative potential of technology in empowering individuals to make informed decisions and pursue rewarding career opportunities.

#### **FUTURE ENHANCEMENT**

Looking ahead, several avenues for enhancing the skill/job recommender application present themselves. Integration of natural language processing (NLP) capabilities could enrich the chatbot functionality, enabling more nuanced and contextually relevant interactions with users. Additionally, incorporating predictive analytics could enable the application to anticipate future job trends and provide proactive career guidance. Furthermore, expanding the scope of the knowledge hub to include multimedia content such as videos and interactive tutorials could enhance user engagement and learning outcomes. Continuous refinement of recommendation algorithms and user interfaces based on feedback and emerging technologies will ensure the application remains at the forefront of career guidance innovation.

## APPENDIX

### SOURCE CODE:

#### Main .php

```
<?php
// Initialize the session
session_start();
?>

<!DOCTYPE html>
<html lang="en">
<?php include 'header.php'?>
    <!-- Home -->
        <div id="home" class="hero-area">

            <!-- Background Image -->
            <div class="bg-image bg-parallax overlay" style="background-
image:url(/img/bg.jpg); width:100%; height: 656px;"></div>
            <!-- /Background Image -->

            <div class="home-wrapper">
                <div class="container">
                    <div class="row">
                        <div class="col-md-8">

                            <h1 class="white-text" style="font-size:
40px;margin-top: 20px;
margin-bottom:50px;">Career Guidance
System</h1>

                            <?php
                                // Check if the user is logged in, if
not then redirect him to login page
                                if(!isset($_SESSION["loggedin"]) ||
$_SESSION["loggedin"] !== true):?>
```

```
<p class="lead white-text" style="margin-left: 5px;" ><b>Discover  
yourself<br>Take the test to find the perfect role for you after Engineering</b></p>
```

```
<a class="main-button icon-  
button" href="login.php">Get Started!</a>
```

```
<?php else: ?>  
<p class="lead white-text"  
style="margin-left: 5px;" ><b>Hi, <?php echo  
htmlspecialchars($_SESSION["username"]); ?> !<br><b>Discover  
yourself,<br>Take the test to find the perfect role for you after Engineering</b></p>
```

```
<a class="main-button icon-  
button" href="http://127.0.0.1:5000/">Get Started!</a>
```

```
<?php endif ?>
```

```
</div>  
</div>  
</div>  
</div>  
  
</div>  
<!-- /Home -->
```

```
<!-- Why us -->  
<div id="why-us" class="section">  
  
<!-- container -->  
<div class="container">  
  
<!-- row -->  
<div class="row">  
<div class="section-header text-center">
```

```

        <h2 style="margin-top: 100px; font-size:
45px;">Welcome to Career.ly</h2>
        <!--<p class="lead">We all want to fly high and
in real time!<br> And in this random pursuit of success, we end up making wrong
career choices.</p>-->
        <p class="lead"><b style="color: rgb(56, 48,
48);">Career.ly</b> is one stop destination <br>in helping you understand yourself,
the best career for you <br> and providing all the resources in the process.</p>
        </div>
    </div>

    <div class="row">
        <!-- feature -->
        <div class="col-md-4">
            <div class="feature">
                <i class="feature-icon fa "><span>
&#x1F50E;&#xFE0E;</span></i>
                <div class="feature-content">
                    <a href="#" >
                        <?php
// Check if the user is logged in, if
not then redirect him to login page
                        if(!isset($_SESSION["loggedin"]) ||
$_SESSION["loggedin"] !== true):?>
                            <a
href="login.php"><h4>Career Prediction</h4></a>
                        <?php else: ?>
                            <a
href="http://127.0.0.1:5000/"><h4>Career Prediction</h4></a>

                        <?php endif ?>

                    <p>Take the test to find the perfect
role for you after Engineering.</p>
                </div>
            </div>
        </div>
    </div>

```



```

</div>
<!-- /feature -->

<!-- feature -->
<div class="col-md-4">
    <div class="feature">
        <i class="feature-icon fa
"><span>&#x1F50E;&#xFE0E;</span></i>
            <div class="feature-content">
                <a href="blog.php" >
                <h4>Knowledge Network</h4>
                </a>
                <p>Gain knowledge through various
sources, like important informational links, access to study materials, etc.</p>
            </div>
        </div>
    </div>
</div>
<!-- /feature -->

<!-- feature -->
<div class="col-md-4">
    <div class="feature">
        <i class="feature-icon fa
"><span>&#x1F50E;&#xFE0E;</span></i>
            <div class="feature-content">
                <a href="courses.php" >
                <h4>Online Courses</h4>
                </a>
                <p>Links to relevant Courses.</p>
            </div>
        </div>
    </div>
</div>
<!-- /feature -->

</div>
<!-- /row -->

<hr class="section-hr">

```

```

        </div>
        <!-- /container -->

</div>
<!-- /Why us -->

<!-- Call To Action -->
<div id="cta" class="section" style="height: 400px;">

        <!-- Background Image -->
        <div class="bg-image bg-parallax overlay" style="background-
image:url(/img/bgmid.jpg)"></div>
        <!-- /Background Image -->

        <!-- container -->
        <div class="container">

                <!-- row -->
                <div class="row">

                        <div class="col-md-6">

                                <?php
                                // Check if the user is logged in, if
                                not then redirect him to login page
                                if(!isset($_SESSION["loggedin"]) ||
                                $_SESSION["loggedin"] !== true):?>
                                <h2 class="white-text"
                                style="font-size: 30px; width:700px ;">Hi,</h2>

                                <h2 class="white-text"
                                style="font-size: 25px; width:700px ; margin-top:10px;">Your Career Path Begins
                                Here</h2>

                                <p class="lead white-text"
                                >We Create Beautiful Experiences

                                That Drive Successful

```

Careers.</p>

<a class="main-button icon-button" href="register.php">Get Started!</a>

<?php else: ?>

<h2 class="white-text" style="font-size: 30px; width:700px ;">Hi, <b><?php echo htmlspecialchars(\$\_SESSION["username"]); ?> !</b></h2>

<h2 class="white-text" style="font-size: 25px; width:700px ; margin-top:10px;">Your Career Path Begins Here</h2>

<p class="lead white-text" >We Create Beautiful Experiences

That Drive Successful

Careers.</p>

<a class="main-button icon-button" href="main.php">Get Started!</a>

<?php endif ?>

</div>

</div>

<!-- /row -->

</div>

<!-- /container -->

</div>

<!-- /Call To Action -->

<!-- About -->

<div id="about" class="section">

<!-- container -->

<div class="container">

<!-- row -->

<div class="row">

```

<div class="col-md-6">
  <div class="section-header">
    <h2 style="font-size: 35px;">About
Career.ly</h2>

    <p class="lead" style="font-size: 18px;
font-style: italic; margin-top: 50px;">Education seekers get a personalised
experience on our site, based on educational background and career interest, enabling
them to make well informed course and career decisions. The decision making is
empowered with easy access to detailed information on career choices, courses,
exams, colleges, admission criteria, eligibility, placement statistics, rankings,
reviews, scholarships, latest updates etc as well as by interacting with other career.ly
users, experts, current students in colleges and alumni groups. We have introduced
several student oriented products and tools like Career Prediction, Knowledge
Network, Daily Bytes, Blogs, Community discussion forum, and various
Courses.</p>

    <!--Education seekers get a personalised
experience on our site, based on educational background and career interest, enabling
them to make well informed course and college decisions. The decision making is
empowered with easy access to detailed information on career choices, courses,
exams, colleges, admission criteria, eligibility, fees, placement statistics, rankings,
reviews, scholarships, latest updates etc as well as by interacting with other
Shiksha.com users, experts, current students in colleges and alumni groups. We have
introduced several student oriented products and tools like Career Central, Common
Application Form, Top Colleges, College Compare, Alumni Employment Stats,
Campus Connect, College Reviews, College Predictors, MyShortlist and Shiksha
Café.-->

  </div>

</div>

<div class="col-md-6">
  <div class="about-img">
    
  </div>
</div>

</div>
<!-- row -->

```

```

        <hr class="section-hr">
    </div>
    <!-- container -->
</div>
<!-- /About -->

<!-- Contact CTA -->
<div id="contact-cta" class="section" style="height: 400px;">

    <!-- Background Image -->
    <div class="bg-image bg-parallax overlay" style="background-
image:url(/img/cta2-background.jpg)"></div>
    <!-- Background Image -->

    <!-- container -->
    <div class="container">

        <!-- row -->
        <div class="row">

            <div class="col-md-8 col-md-offset-2 text-center">
                <h2 class="white-text">Contact Us</h2>
                <p class="lead white-text">Help us to get to
know you.</p>
                <a class="main-button icon-button"
href="contact.php">Contact Us Now</a>
            </div>

        </div>
    <!-- /row -->

</div>
<!-- /container -->

</div>
<!-- /Contact CTA -->

```

</html>

## **Testapp.py**

```
from flask import Flask, render_template, request
from markupsafe import Markup, escape
import pickle
import numpy as np
```

```
app = Flask(__name__)
```

```
@app.route('/')
def career():
    return render_template("hometest.html")
```

```
@app.route('/predict', methods=['POST', 'GET'])
def result():
    if request.method == 'POST':
        result = request.form
        print(result)
        res = result.to_dict(flat=True)
        print("res:", res)
```

```
# Convert input values to numeric types
arr = [float(value) for value in res.values()]
```

```
data = np.array(arr)
data = data.reshape(1, -1)
print(data)
```

```
loaded_model = pickle.load(open("careerlast.pkl", 'rb'))
predictions = loaded_model.predict(data)
print(predictions)
```

```
pred = loaded_model.predict_proba(data)
print(pred)
pred = pred > 0.05
```

```

i = 0
j = 0
index = 0
res = {}
final_res = {}
while j < 17:
    if pred[i, j]:
        res[index] = j
        index += 1
    j += 1

index = 0
for key, values in res.items():
    if values != predictions[0]:
        final_res[index] = values
        print('final_res[index]:', final_res[index])
        index += 1

jobs_dict = {
    0: 'AI ML Specialist',
    1: 'API Integration Specialist',
    2: 'Application Support Engineer',
    3: 'Business Analyst',
    4: 'Customer Service Executive',
    5: 'Cyber Security Specialist',
    6: 'Data Scientist',
    7: 'Database Administrator',
    8: 'Graphics Designer',
    9: 'Hardware Engineer',
    10: 'Helpdesk Engineer',
    11: 'Information Security Specialist',
    12: 'Networking Engineer',
    13: 'Project Manager',
    14: 'Software Developer',
    15: 'Software Tester',
    16: 'Technical Writer'
}

```

```

        data1 = predictions[0]
        print(data1)
        return render_template("testafter.html", final_res=final_res, job_dict=jobs_dict,
                                job0=data1)

if __name__ == '__main__':
    app.run(debug=True)

```

## **Testmodel.py**

```

import pandas as pd
import numpy as np
import pickle
career = pd.read_csv(r'C:\Users\akalamri\Downloads\INTELLIGENT-CAREER-
GUIDANCE-SYSTEM-main\INTELLIGENT-CAREER-GUIDANCE-SYSTEM-
main\dataset9000.data', header = None)
#np.dtype('float64')

X = np.array(career.iloc[:, 0:17]) #X is skills
print(X)
y = np.array(career.iloc[:, 17]) #Y is Roles
print("hi")
print(y)

## attribute to return the column labels of the given Dataframe
career.columns = ["Database Fundamentals", "Computer Architecture", "Distributed
Computing Systems",
"Cyber Security", "Networking", "Development", "Programming Skills", "Project
Management",
"Computer Forensics Fundamentals", "Technical Communication", "AI
ML", "Software Engineering", "Business Analysis",
"Communication skills", "Data Science", "Troubleshooting skills", "Graphics
Designing", "Roles"]

career.dropna(how='all', inplace = True)
#print("career.dropna(how='all', inplace = True)", career.dropna(how='all', inplace =
True))
career.head()

```



```

## splitting the data into training and test sets
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size = 0.3, random_state =
524)
from sklearn.neighbors import KNeighborsClassifier
from sklearn import metrics
scores = {}
knn = KNeighborsClassifier(n_neighbors=5)

knn.fit(X_train, y_train)
print('X_train',X_train)
print('y_train',y_train)
y_pred = knn.predict(X_test)
print('y_pred',y_pred)
scores[5] = metrics.accuracy_score(y_test, y_pred)
print('Accuracy=',scores[5]*100)

pickle.dump(knn, open('careerlast.pkl','wb'))
print('test file created')

```

## **Bagging .py**

```

from sklearn import model_selection
from sklearn.ensemble import BaggingClassifier
from sklearn.tree import DecisionTreeClassifier
import pandas as pd
import numpy as np
import pickle

# load the data
dataset = pd.read_csv(r'C:\Users\akalamri\Downloads\INTELLIGENT-CAREER-
GUIDANCE-SYSTEM-main\INTELLIGENT-CAREER-GUIDANCE-SYSTEM-
main\dataset9000.data', header=None)
print(dataset.head())

# Prepare the data
X = np.array(dataset.iloc[:, 0:17])
print(X)

```

```

Y = np.array(dataset.iloc[:, 17])
print(Y)

dataset.columns = [
    "Database Fundamentals", "Computer Architecture", "Distributed Computing
Systems",
    "Cyber-Security", "Networking", "Development", "Programming Skills", "Project
Management",
    "Computer Forensics Fundamentals", "Technical Communication", "AI ML",
    "Software Engineering", "Business Analysis",
    "Communication skills", "Data Science", "Troubleshooting-skills", "Graphics
Designing", "Roles"
]
dataset.dropna(how='all', inplace=True)

seed = 5

# Initialize KFold with shuffle=True
kfold = model_selection.KFold(n_splits=15, shuffle=True, random_state=seed)

# Initialize the base classifier
base_cls = DecisionTreeClassifier()

# Number of base classifiers
num_trees = 50

# Number of base classifiers
num_trees = 50

# Bagging classifier
model = BaggingClassifier(estimator=base_cls, n_estimators=num_trees,
random_state=seed)

# Evaluate the model
results = model_selection.cross_val_score(model, X, Y, cv=kfold)
print("Accuracy:", results.mean() * 100)

```

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