SELF CAREER PREDICTION SYSTEM FOR STUDENTS

A PROJECT REPORT

Submitted by

KAVIPRIYA B (210701115)
LAKSHASRI D P (210701128)
SRUTHI S (210701262)

in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

RAJALAKSHMI ENGINEERING COLLEGE

ANNA UNIVERSITY, CHENNAI

APRIL 2024

RAJALAKSHMI ENGINEERING COLLEGE, CHENNAI

BONAFIDE CERTIFICATE

Certified that this Thesis titled **"SELF CAREER PREDICTION SYSTEM FOR STUDENTS**" is the bonafide work of "**KAVIPRIYA B (210701115), LAKSHASRI D P (210701128), SRUTHI S (210701262)**" who carried out the work under my supervision. Certified furtherthat 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 onan earlier occasion on this or any other candidate.

SIGNATURE

Dr. K. Anand M.E, Ph.D.,

PROJECT COORDINATOR

Professor,

Department of Computer Science and Engineering

Rajalakshmi Engineering College,

Chennai - 602105

Submitted to Mini Project Viva-Voce Examination held on_____

Internal Examiner **External Examiner**

ABSTRACT

Career choice has a pivotal role in college students' life planning. In today's world choosing the right career is the toughest decision. Today many students are confused about their future. They do possess some skills but they are not able to identify their abilities and a proper domain. Different people suggest different career options but at last, the student has to select their career. In this project, we have focused on this problem of the student using machine learning. In order to overcome the aforementioned shortcomings, our project creates a recommender system based on student preferences. This system gathers student data and suggests the better work domain based on the skills, interests and academic performance provided. This project uses a web app designed using HTML, CSS, Javascript, Flask, PHP and KNN to predict job role and help students by getting inputs from them across different skills. Student profiles develop into multidimensional vectors that represent their personalities, interests, grades, and skills. Based on these traits, the system then determines the K closest neighbors, or K most comparable students. By looking at these neighbours professional histories, recommendations can be made that are weighted by similar students performance indicators or based on prevalence. This method adjusts effectively to new data and provides interpretable recommendations with explicit reasons.

ACKNOWLEDGMENT

First, we thank the almighty god for the successful completion of the project. Our sincere thanks to our chairman **Mr. S. Meganathan B.E., F.I.E.,** for his sincere endeavor in educating us in his premier institution. We would like to express our deep gratitude to our beloved Chairperson **Dr. Thangam Meganathan Ph.D.,** for her enthusiastic motivation which inspired us a lot in completing this project and Vice Chairman **Mr. Abhay Shankar Meganathan B.E., M.S.,** for providing us with the requisite infrastructure.

We also express our sincere gratitude to our college Principal, **Dr. S. N. Murugesan M.E., PhD.,** and **Dr. P. KUMAR M.E., PhD, Director computing and information science , and Head Of Department of Computer Science and Engineering** and our project coordinator **Dr. K.Anand M.E.,Ph.D.,** for her encouragement and guiding us throughout the project towards successful completion of this project and to our parents, friends, all faculty members and supporting staffs for their direct and indirect involvement in successful completion of the project for their encouragement and support.

KAVIPRIYA B

LAKSHASRI D P

SRUTHI S

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVATIONS

KNN	K-Nearest Neighbours
AI	Artificial Intelligence
ML	Machine Learning
HTML	Hypertext Markup Language
CSS	Cascading Style Sheets
PHP	Hypertext Preprocessor

CHAPTER 1

INTRODUCTION

A self-career prediction system for students makes predictions about possible career routes based on their unique student profiles. Numerous data points, such as academic achievement, interests, abilities, extracurricular activities, and even socioeconomic background, are usually collected and analyzed by this method. The system finds patterns and relationships using machine learning techniques like regression, clustering, and classification that might not be seen using conventional career advising approaches. For example, it can identify subjects that a student will likely thrive in or be enthusiastic about by comparing their data with past records of accomplished individuals in other professions. Furthermore, the algorithm is flexible enough to adjust over time, improving its forecasts in light of fresh information and results. In addition to assisting students in making well-informed decisions about their academic and career paths, this individualized method gives educational institutions important information that they can use to further customize their counseling and support programs.

There are many options available to pupils when it comes to their future employment in the quickly changing world of today. Because there are so many options available, it can be intimidating for young people to choose wisely. The Self-Career Predicting System (SCPS) is a cutting-edge tool that uses technology and data-driven insights to help students discover and pursue appropriate career choices in order to address this difficulty.

One of the most important parts of a student's academic experience is career planning. While still beneficial, traditional career counseling techniques can suffer from a lack of resources and may not provide the individualized attention that today's varied student body requires. The development of machine learning and artificial intelligence provide a chance to completely change the way students approach career planning. The SCPS seeks to close this gap by offering a customized, all-inclusive, and easily accessible career counseling platform.

1.1 PROBLEM STATEMENT

Develop a website using open-source data as career guidance and job recommender for aspiring youth that acts as skill or job recommender transforming career guidance by leveraging technology to match individuals with suitable jobs fostering efficient employment and career development.

1.2 SCOPE OF THE WORK

The Career Guidance app aims to bridge the gap between education and employment services by providing comprehensive and accessible career guidance tools. This project will focus on delivering personalized career assessments, career exploration tools, resume building and interview preparation resources, and expanding networking and mentorship opportunities.

1.3 AIM AND OBJECTIVES

The Career Guidance App project aims to create a user-friendly, comprehensive, and easily available platform that connects education and job services, promoting career development and lifelong learning. In order to give users individualized career advice and support and assist them in making well-informed decisions regarding their career routes, the app will make use of sophisticated algorithms and data-driven insights.

Facilitating Informed Decision-Making: The system should help students make well-informed decisions about their career paths by providing comprehensive information about different industries, job roles, educational pathways, and skill requirements.

Exploring Diverse Career Options: The system should expose students to a wide range of career options, including emerging fields and non-traditional career paths, allowing them to explore and consider a variety of opportunities beyond conventional choices.

Supporting Educational Planning: By providing insights into educational pathways, such as college majors, vocational training programs, certifications, and apprenticeships, the system should assist students in planning their academic journey to acquire the necessary skills and qualifications for their chosen careers.

Developing Career Readiness Skills: The system should offer resources and tools to help students develop essential career readiness skills, including resume writing, interviewing skills, networking, professional etiquette, and workplace communication.

1.4 RESEARCH

This project has been developed through widespread secondary research of accredited manuscripts, standard papers, business journals, white papers, analysts' information, and conference reviews. Significant resources are required to achieve an efficacious completion of this project.

The following prospectus details a list of resources that will play a primary role in the successful execution of our project:

- A properly functioning workstation (PC, laptop, net-books etc.) to carry out desired research and collect relevant content.
- Unlimited internet access.
- Unrestricted access to the university lab in order to gather a variety of literature including academic resources (for e.g. Prolog tutorials, online programming examples, bulletins, publications, e-books, journals etc.), technical manuscripts, etc. Prolog development kit in order to program the desired system and other related software that will be required to perform our research.

1.5 MOTIVATION

Choosing a career path is a daunting task for many college students. While they may have some skills and interests, they often struggle to identify their full potential and find a good fit in the vast world of work. Existing career advice can be scattered and overwhelming. This project aims to address this challenge by creating a machine learning-based recommender system specifically designed for students. This system will analyze a student's skills, interests, and academic performance to suggest suitable career paths. By using a neighbor-based approach, the system can learn from the professional journeys of similar students and provide targeted recommendations with clear justifications. This innovative project has the potential to empower students to make informed career decisions and navigate their futures with greater confidence.

CHAPTER 2
LITRETURE SURVEY

[1] While academic metrics such as transcripts and GPA are commonly used to evaluate students' knowledge acquisition, there are limited comprehensive metrics to measure their preparedness for the challenges of post-graduation life. This research paper explores the impact of various factors on university students' readiness for change and transition, with a focus on their preparedness for careers. The methodology employed in this study involves designing a survey based on Paul J. Mayer's "The Balance Wheel" to capture students' sentiments on various life aspects, including satisfaction with the educational process and expectations of salary.

[2] Grounded in self-concept theory, this study examined the predictability of cognitive and affective academic self-concepts in relation to vocational education students' education and career choice outcomes in the Hong Kong HE setting in two studies. Structural equation modeling revealed that sense of competence (i.e., cognitive) is more related to competence/performance-based outcomes. Liking of the vocation is more related to non-performance-based emotional-motivational outcomes than is the cognitive component. These findings offer an empirical basis to guide vocational higher education institutes to effectively use educational resources to build a sustainable future workforce.

[3] Prior studies show students' career self-efficacy (CSE) significantly impacts their employability. This study utilized a design thinking approach to identify various stakeholders and perceived self-efficacy enablers and barriers among MBA students in India. Six student groups participated in the design thinking workshop and collected responses from 125 students. The most important stakeholders, barriers, and enablers of career self-efficacy in different MBA student segments were identified. The 3C (Career Course, Coach, and Cohort) framework of intervention strategies was proposed under the context of the Social Cognitive Career Theory (SCCT). It was conceptualized that these intervention strategies would mediate the association between the learning experience and self-efficacy expectations. This paper has practical implications for management instructors and administrators who can implement the intervention techniques suggested in the study to enhance the CSE of MBA students in their colleges.

[4] This study expands scholarship on attainment of professional achievements in public relations by seeking an explanation of motivations. The survey provided some evidence that the Social Cognitive Career Theory factors of individual professional confidence, self-efficacy and goal-setting may have influence. However, value expectation appears to be the stronger motivator to pursue these achievements, and that value can be intrinsic or extrinsic.

[5] Resource conservation theory asserts that when individuals interact with the environment, those with sufficient resources, such as character strengths, can better deal with external pressures, reduce threats caused by resource depletion, and obtain more resources. Character strengths have been shown to contribute to physical and mental development in many situations. Positive attributes can alleviate the pressure faced by individuals regarding challenging situations, as opportunities for personal development can promote positive interaction with the career environment and help poor students improve their career adaptability.

[6] In the current dynamic environment, career patterns are becoming less steady and predictable. Under this occupational context, employees tend to pursue sustainable career development rather than “lifelong employment”. Consequently, individuals need to have the capacity of adapting to the changing environment. Career adaptability becomes one of the most important concepts when individuals are confronted with career-related changes. It is conceptualized as “the attitudes, competencies, and behaviours employed by individuals to align themselves with work that is suitable for them” Career adaptability has been proven to produce individual and organizational benefits, such as career development and positive organizational behaviour The recognition of the significance of career adaptability has prompted scholars to explore its impact mechanism.

[7] There has been a growing demand for evidence-based interventions to help students prepare for the transition between university and the world of work. The aim of this study was to investigate the effects of a career counselling intervention, in groups and online, on the career adaptability resources and perceptions of professional development and employability of college students in the final stage of their undergraduate courses. The study was based on career construction theory and the theoretical model for professional development of college students. The student's transition process to the world of work requires means to deal with the changes and uncertainties contemplated in this period of life. Likewise, a person who already works and completes a university degree is also looking for new professional challenges, which can be facilitated through adaptability resources

[8] south Korean vocational psychologists have studied the impact of parental support on children's career self-efficacy using theories validated in the US. However, there is little research examining whether theories developed in the US can be applied to South Korean population. As the cultural context is a critical factor that can shape the associations between parental support and children's career self-efficacy, we address this limitation through meta-analytic review. We located 2615 effect sizes from 147 South Korean studies, and 388 effect sizes from 54 US studies. By synthesizing and comparing these results, we found general support for our hypotheses. The relations between parental support and career self-efficacy were significant in both nations, from elementary through post-secondary students. In particular, the relations were stronger in South Korea for high school and post-secondary participants.

[9] To support holistic development, adolescent student-athletes are encouraged to integrate sport with education/academics (i.e., dual careers). Career adaptability, as a psychological resource, may help youth athletes cope with transitions and successfully manage their careers. Individuals with a plan and higher expectations for the future demonstrate higher career adaptability and are better prepared for the future. In the present study, we examined what kinds of distinct career adaptability profiles could be identified among youth athletes in Finland at the transition stage to a sports high school (i.e., specialized school for athletes). Moreover, we investigated whether youth athletes' success expectations about school and sport, and corresponding parental expectations, predicted the probability of student-athletes demonstrating a certain career adaptability profile. Next, we examined how gender was represented in the different profiles.

[10] Little is known about the role that work organisations play in the career development of working students. We tested a serial effects model ($N = 235$; mean age 23 years; 70% female) with antecedents to organisational career growth (self-management, supervisor support, work demands, job-fit, job-relevance), and immediate (work-study conflict/facilitation) and future-focused outcomes (perceived employability). Results indicated supervisor support and job relevance were related to more organisational career growth (59% of variance), which was related directly, and indirectly via work-study conflict (21%) and facilitation (24%), to perceived employability (24%). Work-study conflict and facilitation were highlighted as potential mechanisms for explaining the organisational career growth/employability relationship. The study extends research on organisational career growth to working students and has implications for theory and practice.

.

CHAPTER 3

SYSTEM DESIGN

3.1 DEVELOPMENTAL ENVIRONMENT

The development of this recommender system relied on a web application built with various tools. This included familiar web development languages like HTML, CSS, and Javascript for the user interface. On the backend, Python Flask and PHP were used to handle the server-side logic and data processing. Finally, the project utilized a machine learning technique called K-Nearest Neighbors (KNN) to analyze student data and suggest appropriate job roles. This combination of tools allowed the developers to create a comprehensive system that could gather student information, analyze it using machine learning, and deliver personalized career recommendations.

3.1.1 HARDWARE REQUIREMENTS

The hardware requirements may serve as the basis for a contract for the system's implementation. It should therefore be a complete and consistent specification of the entire system. It is generally used by software engineers as the starting point for the system design.

Table 3.1.1 Hardware Requirements

COMPONENTS	SPECIFICATION
PROCESSOR	Intel Core i5
RAM	4 GB RAM
GPU	Intel Integrated Graphics
HARD DISK	6 GB
PROCESSOR SPEED	1.1 GHz or above

3.1.2 SOFTWARE REQUIREMENTS

The software requirements document is the specifications of the system. It should include both a definition and a specification of requirements.

Table 3.1.2 Software Specifications

FRONT END	HTML, CSS, Bootstrap, JavaScript
BACK END	Python, PHP, Flask
SOFTWARES USED	Visual Studio, XAMP
DATABASE	MySQL

3.2 SYSTEM DESIGN

3.2.1 ARCHITECTURE DIAGRAM

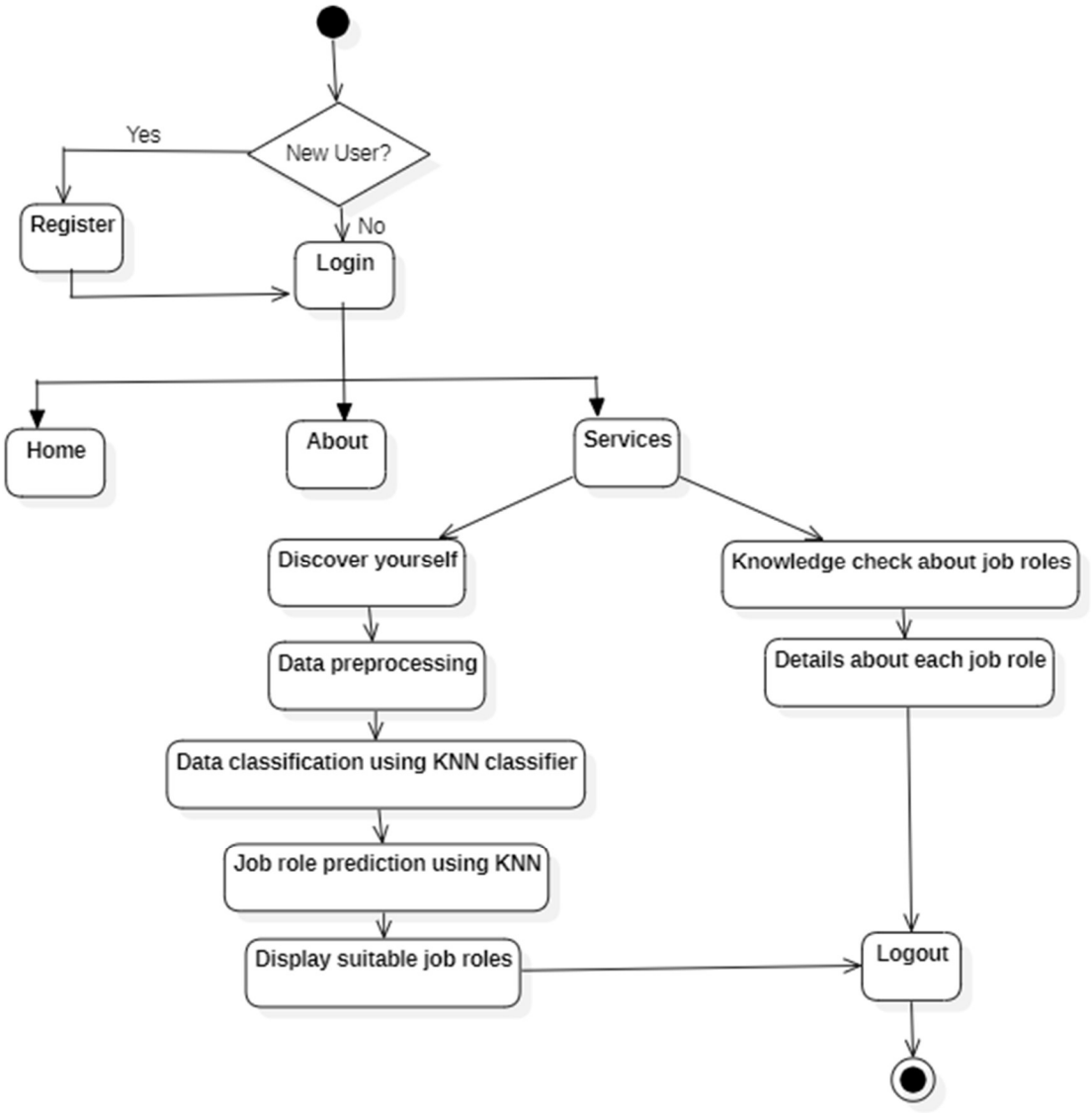

Fig 3.2.1 Architecture Diagram

CHAPTER 4

PROJECT DESCRIPTION

4.1 METHODOLODGY

Choosing a career path can be overwhelming for college students. Skills and interests are plentiful, but identifying the perfect fit within a vast job market can be paralyzing. Traditional career advice often feels scattered and unhelpful. This project tackles this challenge by creating a web-based recommender system powered by machine learning. The system gathers data on a student's skills, interests, and academic performance. This information is then transformed into a multidimensional profile, essentially a unique fingerprint for each user. The core recommendation engine employs a K-Nearest Neighbors (KNN) approach. Imagine a map where students are positioned based on their profiles. KNN identifies the K closest students (neighbors) on this map. By analyzing the career paths of these neighbors, the system recommends suitable work domains for the target student. The recommendations are weighted by factors like the neighbours performance or prevalence in certain fields. This method offers two key advantages. First, adaptability: As more students use the system, the data pool grows, allowing the recommendations to become more refined and relevant over time. Second, interpretability: Recommendations come with clear justifications based on similar student profiles. Students can understand the "why" behind the suggestions, empowering them to make informed career decisions with greater confidence. This project goes beyond just suggesting careers; it fosters self-awareness by explaining the reasoning behind the recommendations, helping students not only choose a path but also understand why it's a good fit for them.

4.2 MODULE DESCRIPTION

4.2.1 Registration and Login:

The students would be registered through a very simple method by username and password. The login credentials would be created and would be validated through every login attempt by verifying it with the one stored in database. It also has the forgot password feature which helps user to change the password if the user forgot theirs.

4.2.2 Discover yourself:

This section would enable the students to take a few tests to discover themselves in terms of their ability, interests, inclination, future plans etc. This would create a student profile which would be used as a baseline for suggesting the possible career options. We will leverage the AI ML techniques to predict the way forward. The test consists of various skill set like Database fundamentals, cyber security, AI ML etc., where the user rates themselves for each course based on their knowledge.

4.2.3 Data Preprocessing:

The data is preprocessed into required format. For Example, the data in data set will be stored in the form of words, nothing but alphabetic. We convert those into numerical format.

4.2.4 Predicting the Skills:

By applying various machine algorithms on the data set, KNN is found to have more accuracy. It suits for the recommendation system to be accurate.

4.2.5 Recommend the respected skill:

Individual students differ from the other students in their skills. Recommendation system helps to predict the inherent skill of a student and suggest them the suitable job roles.

4.2.6 Knowledge Networking:

This module would assist to harness the knowledge through various sources. This would also have a section to provide the information by students, which would be made available only post scrutiny by the admin team.

CHAPTER 5

IMPLEMENTATION AND RESULTS

5.1 IMPLEMENTATION

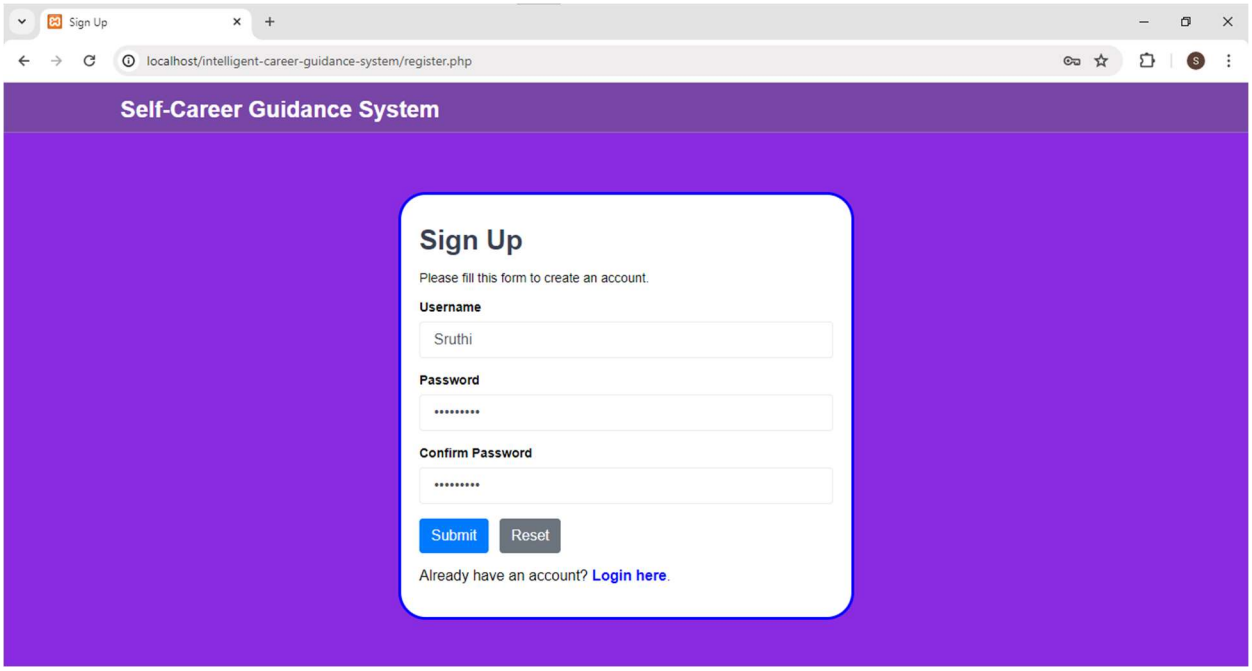

Fig 5.1 Registration

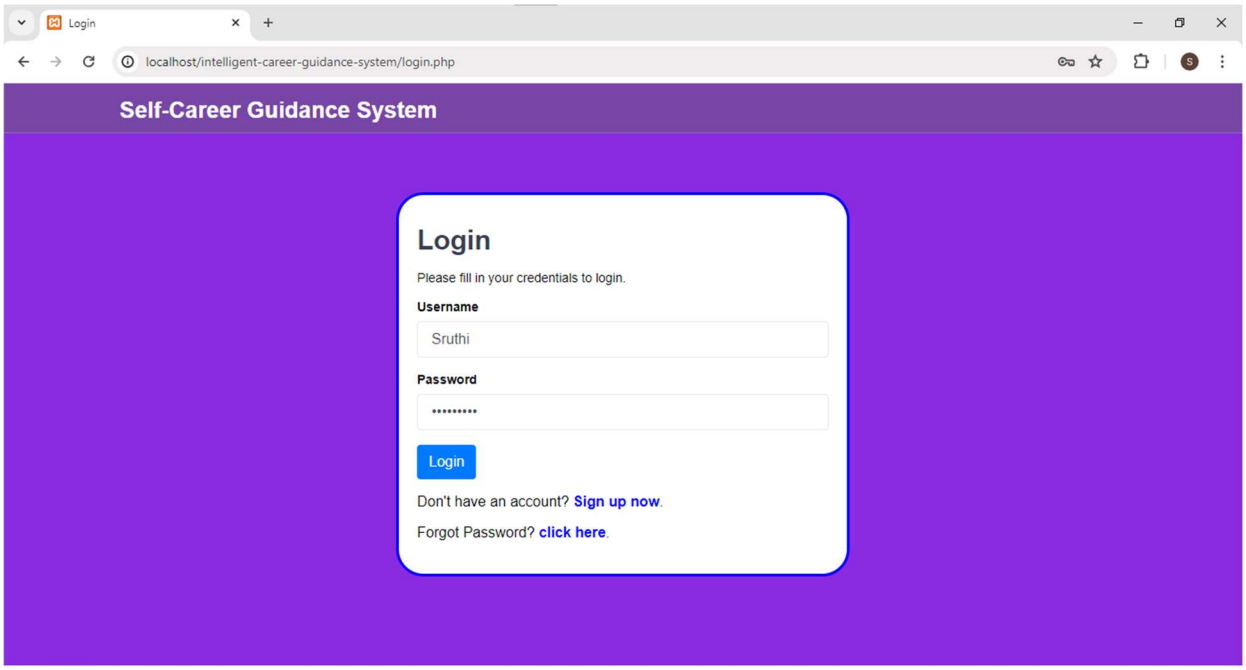

Fig 5.2 Login Page

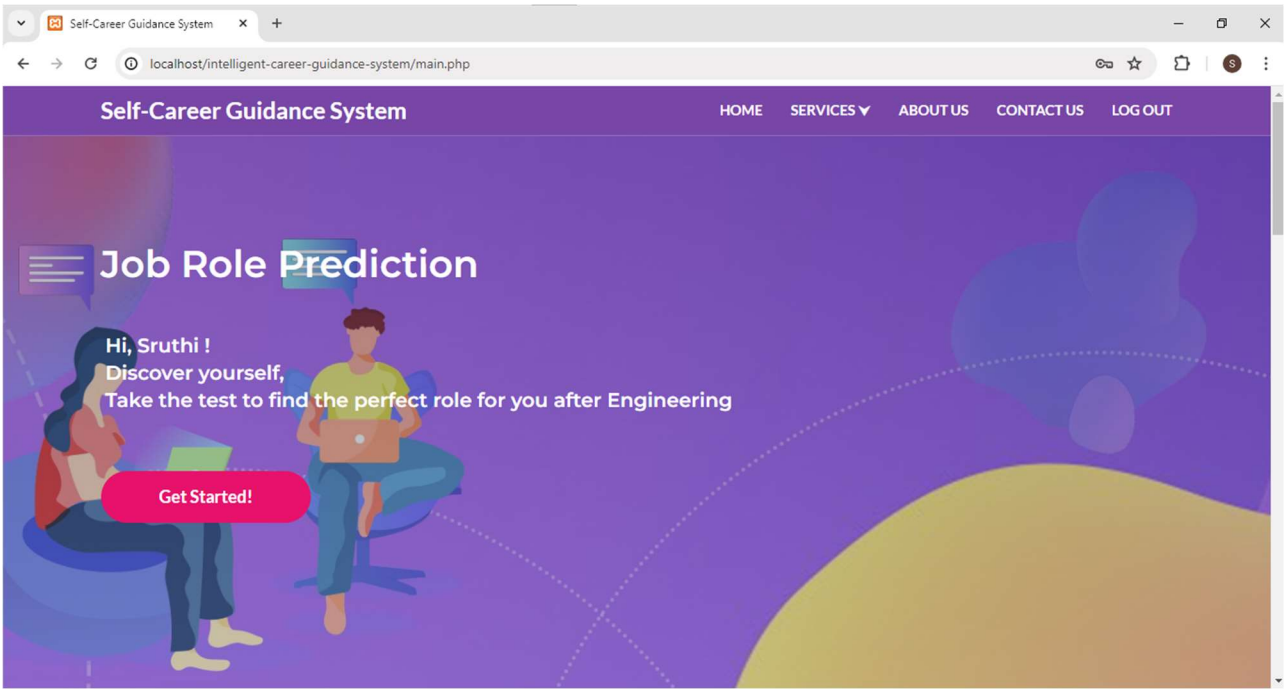

Fig 5.3 Home Page

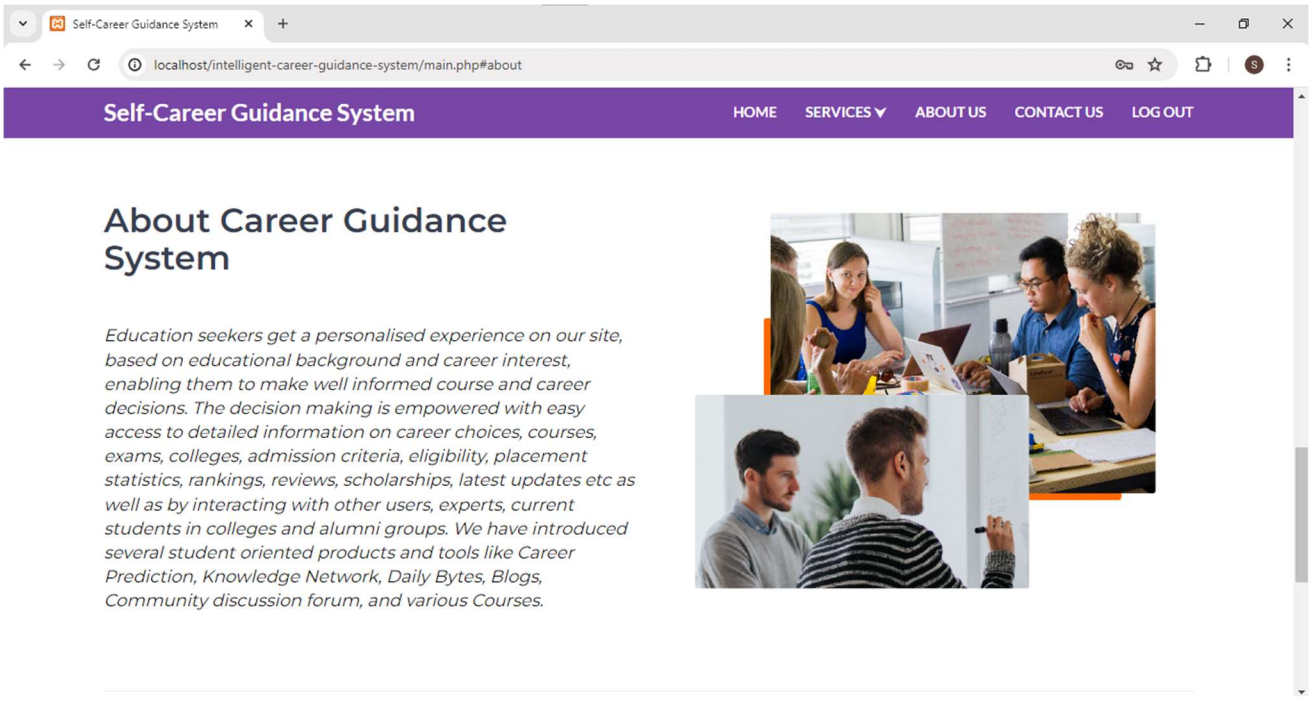

Fig 5.4 About us

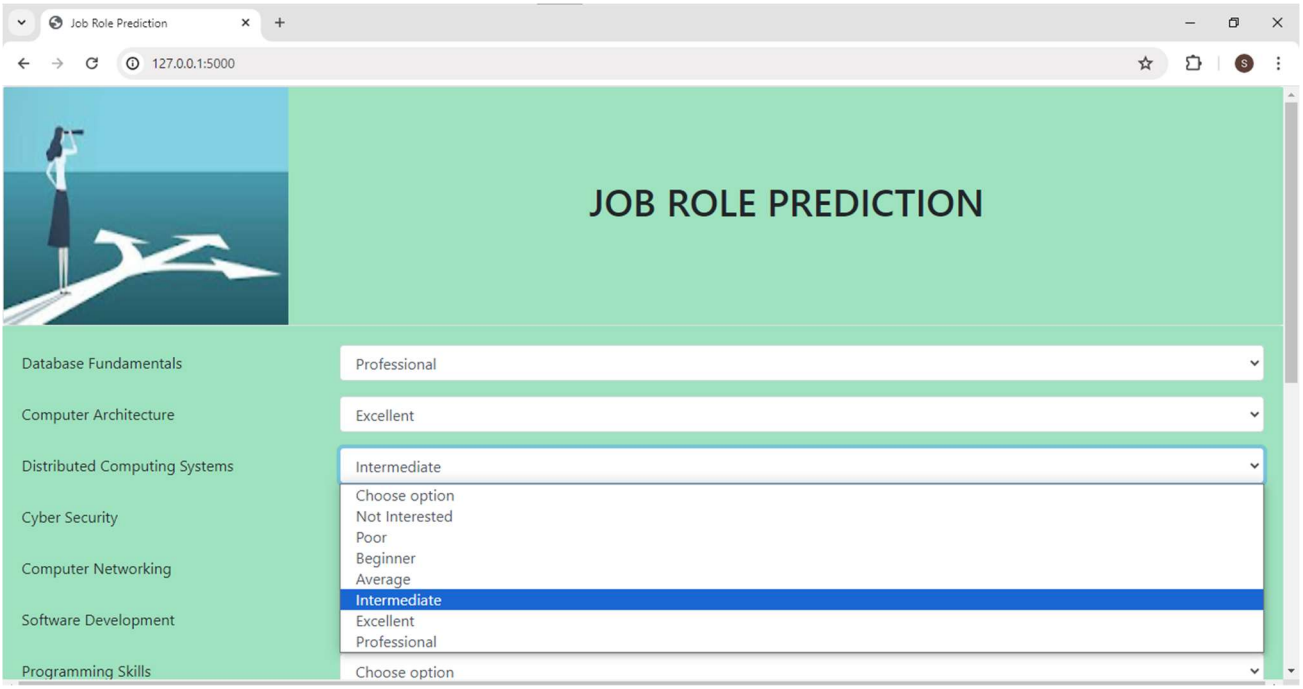

Fig 5.5 Services-Career Prediction

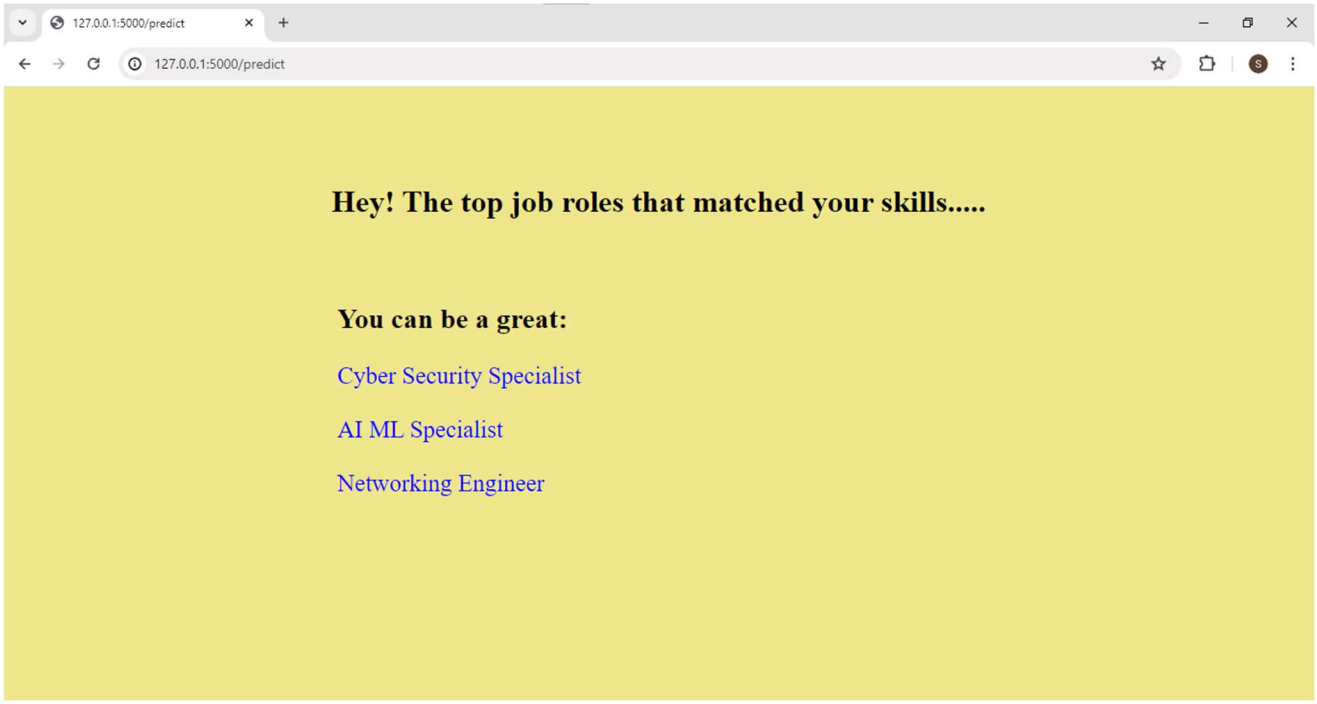

Fig 5.6 Suggested Job Roles

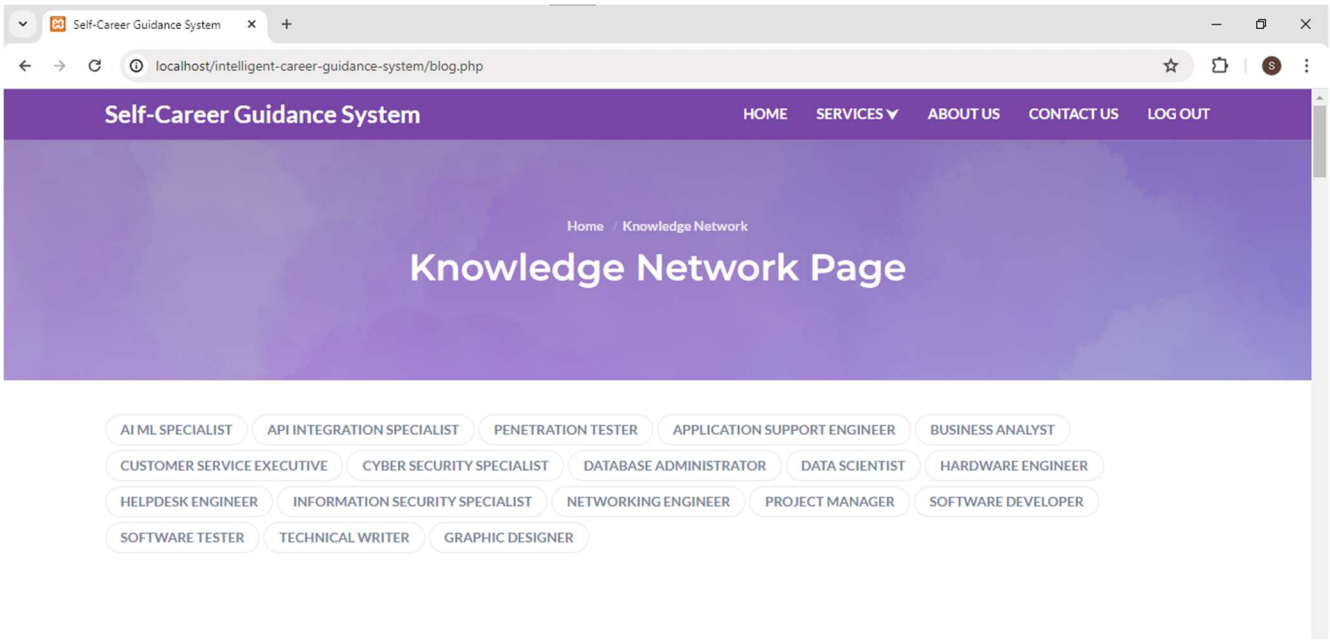

Fig 5.7 Knowledge Check_1

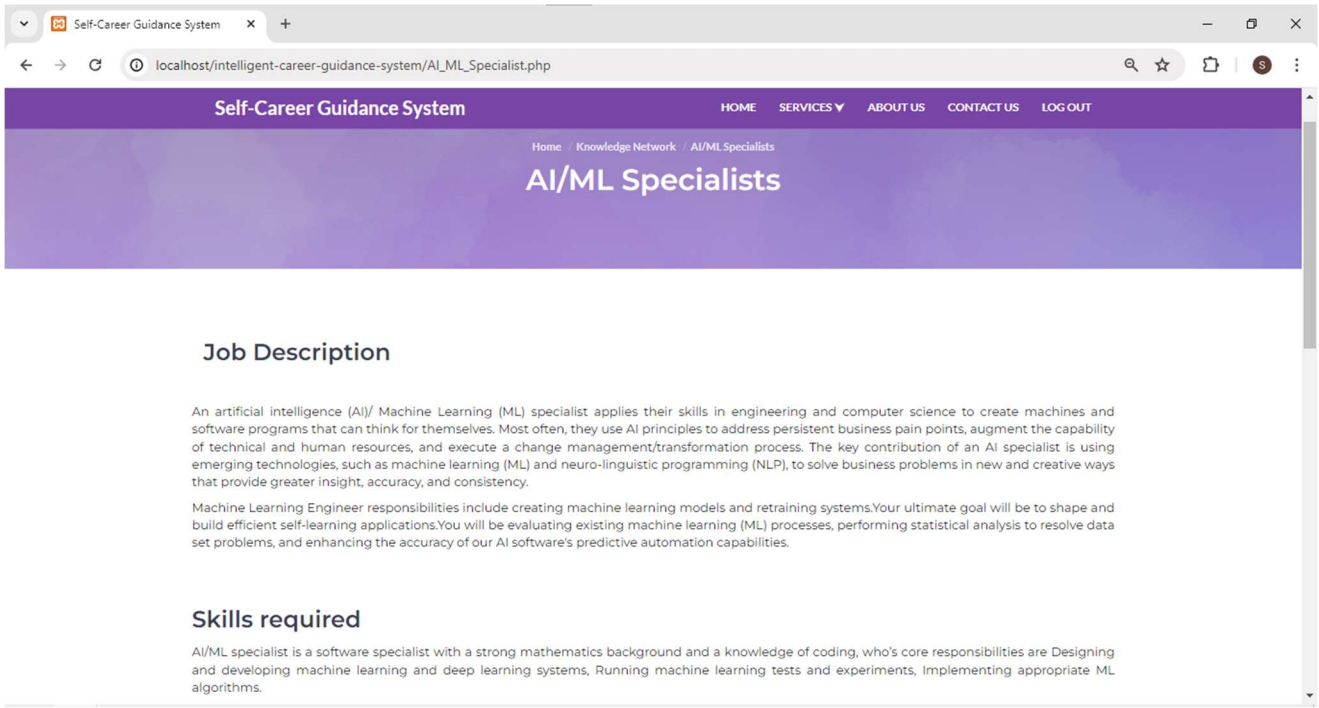

Fig 5.8 Knowledge Check_2

5.2 RESULT

With the aid of this career advising system, students can navigate their future with a holistic approach. Students can access a variety of features by just registering and logging in. Self-assessment assessments and AI/ML are used in the "Discover Yourself" section to generate unique student profiles. In the background, machine learning algorithms prepare data for analysis and forecast a student's innate abilities. Then, based on this data, particular job roles are suggested. Lastly, the knowledge networking module promotes a collaborative learning environment by enabling students to access and contribute career-related information. With the use of machine learning, information sharing, and self-discovery tools, this system gives students the ability to make well-informed career decisions.

CHAPTER 6

CONCLUSION AND FUTURE ENHANCEMENT

6.1 CONCLUSION

To sum up, this method of career coaching provides students with the necessary tools to confidently traverse their chosen path. It integrates a knowledge-sharing platform, K-Nearest Neighbors (KNN) machine learning, and self-discovery exams. Students benefit from this in three main ways. One is self-awareness which involves profile creation and self-assessment assessments provide insightful information about a student's innate abilities and goals. Second is personalized guidance which is based on the accomplishments of students who are similar to you, KNN analysis suggests potential employment fields, providing a flexible and personalized road map for your future. Third is making informed decisions which involves suggestions that are accompanied by concise justifications that help students become more self-aware and comprehend the "why" behind the advice. This method offers students a framework for self-discovery and well-informed decision-making, which allows them to take charge of their future. It goes beyond merely listing job alternatives.

6.2 FUTURE ENHANCEMENT

This career guidance system has a promising future for further enhancements. Integrating real-time labor market data on job growth and salary trends could empower students to make choices based on practicality alongside their interests. Additionally, a 24/7 NLP-powered chatbot advisor could offer personalized guidance and answer student queries anytime. Furthermore, the system could evolve to connect students with relevant skill development resources like online courses or mentorships. Machine learning could be harnessed to analyze a student's career path and suggest opportunities for advancement or transitions based on industry trends. Finally, the system could potentially match student profiles with potential employers seeking qualified candidates, creating a valuable bridge between students and job opportunities. These enhancements would solidify this system's role as a comprehensive and future-oriented platform for student career development.

APPENDIX

SOURCE CODE:

testmodel.py

```
import pandas as pd
import numpy as np
import pickle
career = pd.read_csv('dataset9000.data', header = None)
X = np.array(career.iloc[:, 0:17]) #X is skills
print(X)
y = np.array(career.iloc[:, 17]) #Y is Roles
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')
```

testapp.py

```
from flask import Flask, render_template, request,redirect,url_for
import pickle
import numpy as np
import pandas as pd
loaded_model = pickle.load(open("careerlast.pkl", 'rb'))
app = Flask(__name__)
@app.route('/',methods = ['GET', 'POST'])
def career():
    return render_template("front.html")
@app.route('/predict',methods = ['GET', 'POST'])
def home():
   if request.method == 'POST':
      result = request.form
      i = 0
      print(result)
      res = result.to_dict(flat=True)
      print("res:",res)
      arr1 = res.values()
      arr = ([value for value in arr1])

      data = np.array(arr,dtype="int")

      data = data.reshape(1,-1)
      print(data)

      predictions = loaded_model.predict(data)
     # return render_template('testafter.html',a=predictions)

      print(predictions)
      pred = loaded_model.predict_proba(data)
      print(pred)
      #acc=accuracy_score(pred,)
      pred = pred > 0.05
```

```
#print(predictions)
i = 0
j = 0
index = 0
res = {}
final_res = {}
while j < 17:
    if pred[i, j]:
        res[index] = j
        index += 1
    j += 1
# print(j)
#print(res)
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
#print(final_res)
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'}
#print(jobs_dict[predictions[0]])
job = {}
```

```
    #job[0] = jobs_dict[predictions[0]]
    index = 1
    data1=predictions[0]
    print(data1)
    return
render_template("home.html",final_res=final_res,job_dict=jobs_dict,job0=data1)
if __name__ == '__main__':
   app.run(debug = True)
```

front.html

```
<!DOCTYPE html>
<html>
<link rel="stylesheet" type="text/css" href="Sheet.css" />
<head>
   <title>Job Role Prediction</title>
   <style type="text/css">
body{
background: #9FE2BF;
}
        h1{
            text-align: center;
            color: black;
            border: none;
            font-family: 'Impact';
            }

.container1{
height: 250px;
width: 1350px;
margin: auto;
background-color: #9FE2BF;
}
.col-sm-3  col-form-label{
color: black;
}
.n
{
height: 200px;
width: 1350px;
```

```
}
img{
  float: left;
height: 250px;
width: 300px;
margin-left: auto;
margin-top: 0px;
}

.text {
  align: center;
margin: auto;
  font-size: 130px;
}
 .card-body{
background-color:#9FE2BF;
}
.card-heading{
background-color:#9FE2BF;
}
.form-select form-control
{
width: 30px;
}
head {
        margin:0;
}

        body{
        background-size:cover;
        background-color:Khaki;
  }

       legend{font-size: 20px;
            text-align: center;}


       .note{color: #9FE2BF;}
```

```
   </style>
<linkrel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/css/bootstrap.min.css"
integrity="sha384-
Gn5384xqQ1aoWXA+058RXPxPg6fy4IWvTNh0E263XmFcJlSAwiGgFAW/dAiS6J
Xm" crossorigin="anonymous">
 <script    src="https://code.jquery.com/jquery-3.2.1.slim.min.js"    integrity="sha384-
KJ3o2DKtIkvYIK3UENzmM7KCkRr/rE9/Qpg6aAZGJwFDMVNA/GpGFF93hXpG
5KkN" crossorigin="anonymous"></script>
 <script    src="https://cdn.jsdelivr.net/npm/popper.js@1.12.9/dist/umd/popper.min.js"
integrity="sha384-
ApNbgh9B+Y1QKtv3Rn7W3mgPxhU9K/ScQsAP7hUibX39j7fakFPskvXusvfa0b4Q
" crossorigin="anonymous"></script>
 <script      src="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/js/bootstrap.min.js"
integrity="sha384-
JZR6Spejh4U02d8jOt6vLEHfe/JQGiRRSQQxSfFWpi1MquVdAyjUar5+76PVCmYl
" crossorigin="anonymous"></script>
</head>
<body>
   <div class="page-wrapper bg-gra-03 p-t-45 p-b-50">
      <div class="wrapper wrapper--w790">
         <div class="card card-5">
<div class="container1">
<div class="n">
<div class="image">
<img              src="https://drive.google.com/thumbnail?id=1HDagMTGUMLwnvEN-
ZtQAJuGfa7vxMh1k"  width="300px" height="250px" />
</div><br><br><br><br>
<div class="text">
<h1 align="center" color="#FAF9F6">JOB ROLE PREDICTION</h1>
</div>
</div>
</div>


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

```
<form  method="POST", action="{{url_for('home')}}">

<div class="form-group row">
<label class="col-sm-3 col-form-label">Database Fundamentals</label>
<div class="col-sm-9">
<select class="form-select form-control" required aria-label="select example" name="rate_Database Fundamentals">
<option value="">Choose option</option>
<option value="1">Not Interested</option>
<option value="2">Poor</option>
<option value="3">Beginner</option>
<option value="5">Average</option>
<option value="6">Intermediate</option>
<option value="7">Excellent</option>
<option value="9">Professional</option>
</select>

</div>
</div>
<div class="form-group row">
<label class="col-sm-3 col-form-label">Computer Architecture</label>
<div class="col-sm-9">
<select class="form-select form-control" required aria-label="select example" name="rate_Computer Architecture" >
<option value="">Choose option</option>
<option value="1">Not Interested</option>
<option value="2">Poor</option>
<option value="3">Beginner</option>
<option value="5">Average</option>
<option value="6">Intermediate</option>
<option value="7">Excellent</option>
<option value="9">Professional</option>
</select>
</div>
</div>
<div class="form-group row">
<label class="col-sm-3 col-form-label">Distributed Computing
```

```
Systems</label>
                    <div class="col-sm-9">
                     <select class="form-select form-control" required aria-label="select
example" name="rate_Distributed Computing Systems" >
                          <option value="">Choose option</option>
                          <option value="1">Not Interested</option>
                          <option value="2">Poor</option>
                          <option value="3">Beginner</option>
                          <option value="5">Average</option>
                          <option value="6">Intermediate</option>
                          <option value="7">Excellent</option>
                          <option value="9">Professional</option>
                     </select>
                    </div>
               </div>
               <div class="form-group row">
                    <label  class="col-sm-3  col-form-label">Cyber Security</label>
                    <div class="col-sm-9">
                     <select class="form-select form-control" required aria-label="select
example" name="rate_Cyber Security" >
                          <option value="" >Choose option</option>
                          <option value="1">Not Interested</option>
                          <option value="2">Poor</option>
                          <option value="3">Beginner</option>
                          <option value="5">Average</option>
                          <option value="6">Intermediate</option>
                          <option value="7">Excellent</option>
                          <option value="9">Professional</option>
                     </select>
                    </div>
               </div>
               <div class="form-group row">
                                   <label    class="col-sm-3    col-form-label">Computer
Networking</label>
                    <div class="col-sm-9">
                     <select class="form-select form-control" required aria-label="select
example" name="rate_Networking" >
                          <option value="">Choose option</option>
                          <option value="1">Not Interested</option>
```

```
                    <option value="2">Poor</option>
                    <option value="3">Beginner</option>
                    <option value="5">Average</option>
                    <option value="6">Intermediate</option>
                    <option value="7">Excellent</option>
                    <option value="9">Professional</option>
                 </select>
                </div>
            </div>
            <div class="form-group row">
                                <label  class="col-sm-3  col-form-label">Software Development</label>
                <div class="col-sm-9">
                 <select class="form-select form-control" required aria-label="select example" name="rate_Development" >
                    <option value="">Choose option</option>
                    <option value="1">Not Interested</option>
                    <option value="2">Poor</option>
                    <option value="3">Beginner</option>
                    <option value="5">Average</option>
                    <option value="6">Intermediate</option>
                    <option value="7">Excellent</option>
                    <option value="9">Professional</option>
                 </select>
                </div>
            </div>
            <div class="form-group row">
                                <label  class="col-sm-3  col-form-label">Programming Skills</label>
                <div class="col-sm-9">
                 <select class="form-select form-control" required aria-label="select example" name="rate_Programming Skills" >
                    <option value="">Choose option</option>
                    <option value="1">Not Interested</option>
                    <option value="2">Poor</option>
                    <option value="3">Beginner</option>
                    <option value="5">Average</option>
                    <option value="6">Intermediate</option>
                    <option value="7">Excellent</option>
```

```
                    <option value="9">Professional</option>
                </select>
                </div>
            </div>
            <div class="form-group row">
                                    <label    class="col-sm-3    col-form-label">Project
Management</label>
                <div class="col-sm-9">
                 <select class="form-select form-control" required aria-label="select
example" name="rate_Project Management" >
                    <option value="">Choose option</option>
                    <option value="1">Not Interested</option>
                    <option value="2">Poor</option>
                    <option value="3">Beginner</option>
                    <option value="5">Average</option>
                    <option value="6">Intermediate</option>
                    <option value="7">Excellent</option>
                    <option value="9">Professional</option>
                </select>
                </div>
            </div>
            <div class="form-group row">
                     <label   class="col-sm-3   col-form-label">Computer Forensics
Fundamentals</label>
                <div class="col-sm-9">
                 <select class="form-select form-control" required aria-label="select
example" name="rate_Computer Forensics Fundamentals" >
                    <option value="">Choose option</option>
                    <option value="1">Not Interested</option>
                    <option value="2">Poor</option>
                    <option value="3">Beginner</option>
                    <option value="5">Average</option>
                    <option value="6">Intermediate</option>
                    <option value="7">Excellent</option>
                    <option value="9">Professional</option>
                </select>
                </div>
            </div>
            <div class="form-group row">
```

```
                    <label  class="col-sm-3  col-form-label">Technical Communication skills</label>
                    <div class="col-sm-9">
                     <select class="form-select form-control" required aria-label="select example" name="rate_Technical Communication" >
                          <option value="">Choose option</option>
                          <option value="1">Not Interested</option>
                          <option value="2">Poor</option>
                          <option value="3">Beginner</option>
                          <option value="5">Average</option>
                          <option value="6">Intermediate</option>
                          <option value="7">Excellent</option>
                          <option value="9">Professional</option>
                     </select>
                    </div>
               </div>
               <div class="form-group row">
                    <label  class="col-sm-3  col-form-label">AI ML</label>
                    <div class="col-sm-9">
                     <select class="form-select form-control" required aria-label="select example" name="rate_AI ML" >
                          <option value="">Choose option</option>
                          <option value="1">Not Interested</option>
                          <option value="2">Poor</option>
                          <option value="3">Beginner</option>
                          <option value="5">Average</option>
                          <option value="6">Intermediate</option>
                          <option value="7">Excellent</option>
                          <option value="9">Professional</option>
                     </select>
                    </div>
               </div>
               <div class="form-group row">
                              <label    class="col-sm-3    col-form-label">Software Engineering</label>
                    <div class="col-sm-9">
                     <select class="form-select form-control" required aria-label="select example" name="rate_se" >
                          <option value="">Choose option</option>
```

```
                        <option value="1">Not Interested</option>
                        <option value="2">Poor</option>
                        <option value="3">Beginner</option>
                        <option value="5">Average</option>
                        <option value="6">Intermediate</option>
                        <option value="7">Excellent</option>
                        <option value="9">Professional</option>
                    </select>
                    </div>
            </div>
            <div class="form-group row">
                    <label  class="col-sm-3  col-form-label">Business Analysis</label>
                    <div class="col-sm-9">
                     <select class="form-select form-control" required aria-label="select example" name="rate_Business Analysis" >
                            <option disabled= "disabled" selected="selected">Choose option</option>
                        <option value="1">Not Interested</option>
                        <option value="2">Poor</option>
                        <option value="3">Beginner</option>
                        <option value="5">Average</option>
                        <option value="6">Intermediate</option>
                        <option value="7">Excellent</option>
                        <option value="9">Professional</option>
                    </select>
                    </div>
            </div>
            <div class="form-group row">
                            <label   class="col-sm-3   col-form-label">Communication skills</label>
                    <div class="col-sm-9">
                     <select class="form-select form-control" required aria-label="select example" name="rate_Communication skills" >
                        <option value="">Choose option</option>
                        <option value="1">Not Interested</option>
                        <option value="2">Poor</option>
                        <option value="3">Beginner</option>
                        <option value="5">Average</option>
                        <option value="6">Intermediate</option>
```

```
                        <option value="7">Excellent</option>
                        <option value="9">Professional</option>
                    </select>
                    </div>
            </div>
            <div class="form-group row">
                    <label  class="col-sm-3 col-form-label">Data Science</label>
                    <div class="col-sm-9">
                     <select class="form-select form-control" required aria-label="select
example" name="rate_Data Science" >
                        <option value="">Choose option</option>
                        <option value="1">Not Interested</option>
                        <option value="2">Poor</option>
                        <option value="3">Beginner</option>
                        <option value="5">Average</option>
                        <option value="6">Intermediate</option>
                        <option value="7">Excellent</option>
                        <option value="9">Professional</option>
                    </select>
                    </div>
            </div>
            <div class="form-group row">
                            <label   class="col-sm-3   col-form-label">Troubleshooting
skills</label>
                    <div class="col-sm-9">
                    <select  class="form-control" name="rate_Troubleshooting skills" >
                        <option value="">Choose option</option>
                        <option value="1">Not Interested</option>
                        <option value="2">Poor</option>
                        <option value="3">Beginner</option>
                        <option value="5">Average</option>
                        <option value="6">Intermediate</option>
                        <option value="7">Excellent</option>
                        <option value="9">Professional</option>
                    </select>
                    </div>

            </div>
            <div class="form-group row">
```

```
                                    <label class="col-sm-3 col-form-label">Graphics
Designing</label>
                    <div class="col-sm-9">
                     <select  class="form-control" name="rate" >
                          <option value="">Choose option</option>
                          <option value="1">Not Interested</option>
                          <option value="2">Poor</option>
                          <option value="3">Beginner</option>
                          <option value="5">Average</option>
                          <option value="6">Intermediate</option>
                          <option value="7">Excellent</option>
                          <option value="9">Professional</option>
                     </select>
                    </div>

            </div>
                    <center><button class="btn btn--radius-2 btn--red" type="submit"
>Discover Yourself!</button></center>
            <a href="{{ url_for('home')}}"></a>
            </div>
</div></div>     </form> </div>  </body></html>
```

home.html

```
<html>
<head>
<style>
body{
background: Khaki;
}
.graph-cont{
font-size: 25px;
margin-left: 340px;
}

</style>
</head>
<body>
<br><br><br><br>
<b><h1 align="center">Hey! The top job roles that matched your
```

```
skills.....</h1><br><br></b>
  <div class="graph-cont">
  <h3>You can be a great:</h3>
  <div class="bar bar1" ><font color="blue"> {{ job0 }}</a></font></div><br>
{%for key, value in final_res.items(): %}
  {%if job0!=job_dict[value]%}
                                        <div class="bar bar2"><font
color="blue">{{job_dict[value]}}</a></font></div><br>
  {%endif%}
{%endfor%}
</body>
</html>
```

main.php

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

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

         <!-- Backgound Image -->
                  <div class="bg-image bg-parallax overlay" style="background-
image:url(./img/bg.jpg); width:100%; height: 656px;"></div>
         <!-- /Backgound 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;">Job Role Prediction</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 Guidance System</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">This 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-6">
      <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>
            <!-- /feature -->

            <!-- feature -->
            <div class="col-md-6">
                <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>
            <!-- /feature -->

            <!-- /feature -->

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

        <hr class="section-hr">

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

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

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

    <!-- Backgound Image -->
            <div class="bg-image bg-parallax overlay" style="background-image:url(./img/bgmid.jpg)"></div>
    <!-- /Backgound 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 Guidance System</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  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">
                    <img src="./img/about.png" alt="">
                </div>
            </div>

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

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

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

login.php

```
<?php
// Initialize the session https://www.tutorialrepublic.com/php-tutorial/php-mysql-login-system.php
session_start();

// Check if the user is already logged in, if yes then redirect him to welcome page
if(isset($_SESSION["loggedin"]) && $_SESSION["loggedin"] === true){
   header("location:main.php");
   exit;
}

// Include config file
require_once "config.php";

// Define variables and initialize with empty values
$username = $password = "";
$username_err = $password_err = $login_err = "";

// Processing form data when form is submitted
if($_SERVER["REQUEST_METHOD"] == "POST"){

   // Check if username is empty
   if(empty(trim($_POST["username"]))){
      $username_err = "Please enter username.";
   } else{
```

```
    $username = trim($_POST["username"]);
}

// Check if password is empty
if(empty(trim($_POST["password"]))){
    $password_err = "Please enter your password.";
} else{
    $password = trim($_POST["password"]);
}

// Validate credentials
if(empty($username_err) && empty($password_err)){
    // Prepare a select statement
    $sql = "SELECT id, username, password FROM users WHERE username = ?";

    if($stmt = mysqli_prepare($link, $sql)){
        // Bind variables to the prepared statement as parameters
        mysqli_stmt_bind_param($stmt, "s", $param_username);

        // Set parameters
        $param_username = $username;

        // Attempt to execute the prepared statement
        if(mysqli_stmt_execute($stmt)){
            // Store result
            mysqli_stmt_store_result($stmt);

            // Check if username exists, if yes then verify password
            if(mysqli_stmt_num_rows($stmt) == 1){
                // Bind result variables
                mysqli_stmt_bind_result($stmt, $id, $username, $hashed_password);
                if(mysqli_stmt_fetch($stmt)){
                    if(password_verify($password, $hashed_password)){
                        // Password is correct, so start a new session
                        session_start();

                        // Store data in session variables
                        $_SESSION["loggedin"] = true;
                        $_SESSION["id"] = $id;
```

```
                        $_SESSION["username"] = $username;

                        // Redirect user to welcome page
                        header("location: main.php");
                    } else{
                        // Password is not valid, display a generic error message
                        $login_err = "Invalid username or password.";
                    }
                }
            } else{
                // Username doesn't exist, display a generic error message
                $login_err = "Invalid username or password.";
            }
        } else{
            echo "Oops! Something went wrong. Please try again later.";
        }

        // Close statement
        mysqli_stmt_close($stmt);
    }
}

    // Close connection
    mysqli_close($link);
}
?>

<!DOCTYPE html>
<html lang="en" >
<head>
    <meta charset="UTF-8">
    <title>Login</title>
                                                    <link                    rel="stylesheet"
href="https://stackpath.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css">
    <link type="text/css" rel="stylesheet" href="css/s.css"/>
    <style>
        body{ font: 14px sans-serif;
        margin:auto;
        margin-top: 120px;
```

```
        width:500px;
        background-color: blueviolet;
        color: black;


        }
        .wrapper{  border-style: solid;
        border-color: blue;
        border-radius: 30px;
        padding: 20px;  background-color: white;}
    </style>
</head>
<body>
    <!--Header-->
     <header id="header" class="transparent-nav" style="position: fixed;background-color: rgb(120, 70, 167); top: 0;">
          <div class="container">

              <div class="navbar-header">
                 <!-- Logo -->
                 <div class="navbar-brand">
                     <a class="logo" href="main.php" style="padding-bottom: 10px;">Self-Career Guidance System</a>
                 </div>
                 <!-- /Logo -->

              </div>
          </div>
        </header>
        <!-- /Header -->

    <div class="wrapper" >
        <h2>Login</h2>
        <p>Please fill in your credentials to login.</p>

        <?php
        if(!empty($login_err)){
            echo '<div class="alert alert-danger">' . $login_err . '</div>';
        }
```

```
    ?>

      <form action="<?php echo htmlspecialchars($_SERVER["PHP_SELF"]); ?>" method="post">
        <div class="form-group">
          <label><b>Username</b></label>
            <input type="text" name="username" class="form-control <?php echo (!empty($username_err)) ? 'is-invalid' : ''; ?>" value="<?php echo $username; ?>">
          <span class="invalid-feedback"><?php echo $username_err; ?></span>
        </div>
        <div class="form-group">
          <label><b>Password</b></label>
          <input type="password" name="password" class="form-control <?php echo (!empty($password_err)) ? 'is-invalid' : ''; ?>">
          <span class="invalid-feedback"><?php echo $password_err; ?></span>
        </div>
        <div class="form-group">
          <input type="submit" class="btn btn-primary" value="Login">
        </div>
          <p style="font-size: 16px;">Don't have an account? <a href="register.php" style="color:blue;">Sign up now</a>.</p>
            <p style="font-size: 16px;">Forgot Password? <a href="reset.php" style="color:blue;">click here</a>.</p>
      </form>
   </div>
</body>
</html>
```

REFERENCES

[1] R. Afarian, B.H. Kleiner The relationship between grades and career success Management Research News, 26 (2003), pp. 42-51.

[2] Lindsay, K. Tsey, B.S. Malau-Aduli A systematic review of factors that influence youths career choices: The role of culture Frontiers in Education, 3 (2018), pp. 307-319.

[3] C.C. Chan Social support, career beliefs, and career self-efficacy in determination of Taiwanese college athletes' career development Journal of Hospitality, Leisure, Sport and Tourism Education (2020)

[4] M.S. Neill Accredited vs. non-accredited: How accreditation impacts perceptions and readiness to provide ethics counsel Public Relations Review (2016)

[5] J. Haushofer, E. Fehr On the psychology of poverty Science, 344 (2014), pp. 862-867

[6] A. Bandura Social Foundations of Thought and Action: Social Cognitive Theory, Prentice Hall, Upper Saddle River, NJ (1986)

[7] S. Brown et al. Critical ingredients of career choice interventions: More analyses and new hypotheses Journal of Vocational Behavior (2003)

[8] B.K. Bryant et al. Parenting in relation to child and adolescent vocational development Journal of Vocational Behavior(2006)

[9] T. Asparouhov, B. Muthén Auxiliary variables in mixture modeling: Using the BCH method in Mplus to estimate a distal outcome model and arbitrary secondary model Mplus Web Notes, 21 (2015)

[10] N. Bozionelos et al. Enhancing the sustainability of employees' careers through training Journal of Vocational Behavior (2020)