# INTERACTIVE GUIDE FOR DEGREE AND CAREER CHOICE

**PROJECT REPORT**

**21AD1513- INNOVATION PRACTICES LABS**

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**PANIMALAR ENGINEERING COLLEGE, CHENNAI- 600123**

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## BONAFIDE CERTIFICATE

Certified that this project report titled "**INTERATIVE GUIDE FOR DEGREE AND CAREER CHOICE"** is the bonafide work of **RA NIMISHA** (**211422243218), S SANGEETHA** (**211422243277),**who carried out the project work under my supervision. Certified further, that to the best of my knowledgethe work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conference an earlier occasion on this or any other candidate.

**INTERNAL GUIDE**

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**INTERNAL EXAMINER** **EXTERNAL EXAMINER**

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## ABSTRACT

This project presents an interactive guide designed to assist individuals in making informed degree and career choices aligned with their interests, skills, and aspirations. Leveraging user assessments, the system identifies personal strengths and preferences, offering a structured approach to self- discovery. The guide encourages users to explore various degree programs and career paths by analyzing key aspects such as interests, skills, values, and career outlook. Through a data-driven approach, it suggests academic and professional avenues that match users' strengths and passions. The solution incorporates algorithms like K-Nearest Neighbor (KNN), K-Means Clustering, Decision Tree, and Support Vector Machine to classify and recommend potential career paths based on user data. Additionally, the system provides insights into industry trends, job growth, and salary expectations, helping users weigh factors like job market demand and financial feasibility. A decision-making framework empowers users to evaluate and prioritize their options, considering personal values and professional growth. By synthesizing a range of educational and occupational insights, this guide serves as a comprehensive roadmap, supporting users in setting achievable, satisfying career goals. With its strategic, user-centered design, the guide equips users with the confidence and knowledge to pursue fulfilling careers.

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# CHAPTER 1

# INTRODUCTION

## 1.1 OVERVIEW

The "Interactive Guide for Degree and Career Choice" is designed to empower individuals in making informed decisions about their educational and professional futures by aligning their choices with personal skills, interests, and values. With many students and professionals often feeling uncertain about the best path forward, this project provides a structured, data-driven approach that enhances self-awareness and decision-making confidence. This guide operates through a series of modules that assess a user's strengths, explore relevant degree programs, and evaluate potential career paths. Beginning with a self-assessment, users gain insight into their key interests, abilities, and values, laying the foundation for choices that align with their unique strengths. Users are guided through a series of questions that gauge their preferences and skills, helping the system suggest degree programs and career options that match their individual profiles. In addition to this, users can explore diverse academic paths, understand what each field entails, and identify programs that can translate their interests into rewarding careers. Utilizing machine learning (ML) algorithms, including K-Nearest Neighbor (KNN), K-Means Clustering, Bayesian Classifier, Decision Trees, and Support Vector Machine, the guide classifies users' attributes and suggests suitable career paths. The system also uses natural language processing (NLP) for interaction and provides users with a personalized experience. With a focus on real-world applicability, the system's career outlook module gives a detailed analysis of various fields, including industry growth trends, job demand, and salary expectations. These features equip users with valuable insights, helping them identify careers with strong future potential and make choices with confidence. A decision-making framework embedded in the guide encourages users to weigh various

factors such as job demand, personal satisfaction, and financial viability. Additionally, the system ensures data security by storing user assessments and recommendations in an encrypted database, protecting sensitive user information. Overall, this guide offers a practical and effective solution to the challenges of career and educational planning by integrating advanced ML models and secure, user-friendly web interfaces. It addresses the problem of limited guidance resources for students, particularly those from rural areas or underserved communities who may lack career counseling support. By making the platform accessible to a broad audience and providing multilingual support, this interactive guide ensures that users from diverse backgrounds can benefit from it. With this structured approach, the system aims to reduce uncertainty, minimize the risk of mismatched career or degree choices, and enable users to develop an actionable plan aligned with their aspirations. This project serves as a comprehensive tool for users seeking clarity on their future paths, empowering themto set meaningful goals and pursue fulfilling careers.

## 1.1 PROBLEM DEFINITION

The core problem being addressed is the complexity and uncertainty individuals face when choosing a degree program and career that aligns with their skills, interests, values, and market demand. Many students struggle with this due to limited self- awareness and lack of structured, accessible resources that can guide them through self-assessment, exploration of options, and strategic planning.

This interactive guide aims to empower users by providing tools for self-discovery and structured planning. It helps individuals gain insights into their strengths, interests, and values and applies this understanding to identify suitable degree programs and careers. The guide includes a framework for making critical decisions by examining factors such as job market demand, salary expectations, and industry growth. It enables users to weigh essential criteria, such as personal values and financial considerations, and offers them a roadmap to build a personalized action

plan for academic and career success.

The project employs various algorithms, including K-Nearest Neighbor (KNN), K- Means Clustering, Bayesian Classifier, Decision Trees (ID3), Random Forest, and Support Vector Machine, to enhance the matching process between individual profilesand potential career paths. This use of machine learning algorithms aids in analyzing user inputs and predicting optimal degree and career choices, tailored to each user's unique profile.

The objectives of the project are to foster a deep understanding of personal strengths and values, provide knowledge on various educational and career paths, and enable users to make decisions that lead to fulfilling and successful careers. By integrating self-assessment, degree exploration, and career outlook analysis, this guide is structured to be a comprehensive, interactive, and user-centered tool, ultimately aiming to alleviate the common challenges associated with career planning and decision-making.

The Need for a Solution:

Choosing a suitable degree and career path is often difficult due to limited resources and guidance, leaving many uncertain about their future. The "Interactive Guide for Degree and Career Choice" project addresses this need by providing a structured, accessible platform that empowers users through self-assessment and career exploration tools. It helps individuals understand their strengths, explore academic programs, and assess job market trends, offering tailored recommendations using advanced algorithms. This solution bridges the gap in career planning resources, enabling users to make informed, confident decisions, ultimately fostering a generation better prepared for fulfilling careers.

# CHAPTER 2

# LITERATURE SURVEY

[1] "User-Centered Design in Digital Career Counseling Platforms" by Brown et al.(2021) The authors examine how user-centered design principles enhance digital career guidance, making these tools more accessible and engaging. By focusing on ease of use, feedback mechanisms, and accessibility, platforms can improve user satisfaction and decision-making outcomes. The paper emphasizes the importance of intuitive interfaces in career guidance systems, which increases their overall effectiveness.

[2] "A Systematic Review of Career Guidance Technologies" by Johnson and Clarke (2020)

This review explores the range of digital tools used in career guidance, emphasizing their effectiveness in providing personalized support. It highlights the growing role of technology in empowering students to make informed decisions, especially by enhancing access to self-assessment tools and real-time job market data. The study's findings underscore the potential of interactive platforms to bridge the gap in traditional career counseling through data-driven insights.

[3] "The Role of Labor Market Trends in Career Decision-Making" by Smith and Rogers(2020)

This paper explores how labor market insights influence career choices. By analyzing industry growth rates, salary expectations, and job availability, it highlights the importance of data-driven decision-making in career guidance. The study suggests that providing users with up-to-date market information enables them to make more sustainable career decisions, addressing one of the core challenges of career planning.

[4] "Digital Counseling Systems for Rural Education" by Gupta and Kumar (2019)

This research investigates the role of digital career counseling tools in rural areas, where access to professional guidance is limited. The authors argue that interactive career platforms democratize career guidance, providing equal opportunities for career exploration regardless of geographic location. This finding supports the development of digital solutions that cater to underserved populations, making them particularly valuable for career guidance systems.

[5] "Psychometric Tools in Career Counseling: A Meta-Analysis" by Lee et al. (2019)
This paper investigates the impact of psychometric tools on career guidance, showing how they facilitate self-awareness by evaluating personal interests, values, and skills. The authors suggest that self-assessment tools improve career decision confidence, with data showing increased satisfaction and success in chosen career paths. This research provides a foundation for integrating psychometric evaluations into career guidance platforms.

[6] "A Survey of Decision-Making Frameworks in Career Planning" by Andersson et al.(2018)
Andersson and colleagues provide a review of various decision-making models applied to career counseling, including Rational Choice Theory and cost-benefit analysis. The study highlights how structured frameworks allow individuals to weigh career options systematically, leading to more confident choices. These models are essential for career guidance systems, as they enable users to navigate complexdecisions with a clear set of criteria.

[7] "Machine Learning Applications in Personalized Education Systems" by Zhang andMiller(2018)
This study discusses machine learning’s role in creating personalized educational experiences, particularly through recommendation systems. By analyzing user

profiles and preferences, machine learning algorithms like K-Nearest Neighbor (KNN) and Decision Trees generate tailored career and degree suggestions. The research supports the use of algorithms to enhance career guidance, suggesting they provide more accurate matches by aligning with individual strengths and interests.

[8] "Impact of Interactive Technologies on Career Self-Assessment" by Choi and Wang(2017)

This paper explores the use of interactive tools in career self-assessment, showing that digital platforms offering real-time feedback on skills and values significantly improve user engagement and career clarity. The authors argue that interactive technologies support a higher level of self-understanding, which is critical in identifying suitable educational and career pathways. This aligns with the need for self-discovery tools in career guidance platforms.

[9] "Adaptive Learning Systems in Career Counseling: Enhancing Personalization" by Evans and Green (2019).

This study focuses on adaptive learning systems that adjust recommendations based on real-time feedback from users. By using dynamic algorithms, such as Bayesian and clustering methods, these systems refine career and degree suggestions over time, adapting to changing preferences and newly input data. The findings highlight the effectiveness of adaptive systems in career counseling, as they allow for a more personalized and evolving guidance process.

# CHAPTER 3

# SYSTEM ANALYSIS

## 3.1 EXISTING SYSTEM

The existing systems for career guidance and degree selection often lack the personalization and accessibility required for effective decision-making. Traditional career counseling typically relies on in-person sessions, where counselors provide guidance based on limited interactions and generalized career information. While some educational institutions offer career centers or guidance counselors, these resources are often limited in scope, not fully individualized, and may not include recent labor market insights. Additionally, some digital platforms provide self- assessment tools, career exploration resources, and degree matching services. However, these platforms frequently lack integration of real-time data, such as job market trends, salary projections, and growth opportunities, which are critical for making informed career choices. Moreover, many existing tools are one-size-fits-all, failing to account for unique personal factors like values, skills, and financial considerations. A few advanced systems employ basic algorithms for recommendations, but they generally do not incorporate more sophisticated machine learning models such as K-Nearest Neighbor (KNN) or Support Vector Machines (SVM), which could enable more precise matching. These limitations reduce the effectiveness of the guidance provided, especially in underserved or rural regions where access to in-person counseling is limited.

**Summary of Disadvantages in the Existing System:**

Existing career guidance systems are limited by lack of personalization, outdatedlabor market data, and insufficient integration of user-specific factors like

skills and values. They often rely on basic algorithms, fail to provide real-time insights, and are inaccessible in some regions. These shortcomings make career decision-making less effective, especially for diverse or underserved populations.

### 3.2 PROPOSED SYSTEM

The proposed system is an interactive digital platform aimed at guiding users in choosing a degree program and career path aligned with their skills, interests, and goals. It leverages advanced algorithms such as K-Nearest Neighbor, K-Means Clustering, Bayesian Classifier, Decision Tree (ID3), Random Forest, and Support Vector Machine for personalized analysis and recommendations. The platform is structured around three main modules: self-assessment, degree exploration, and career outlook. This module helps users discover their unique interests, skills, and values. Through a series of assessments, users receive insights into what subjects and topics fascinate them, the skills they excel in, and the work environment that aligns with their values. The module uses clustering and classification algorithms to analyze the user data and provide tailored feedback. Based on the self-assessment, this module suggests academic paths that match the user's passions and skills. Using machine learning models, it aligns user preferences with available degree programs, offering options that best suit their interests and potential career aspirations. This module provides data-driven insights into career trends, industry growth, salary expectations, and job market demand. It includes a decision-making framework that evaluatesfactors like job growth potential, financial considerations, and alignment with personal values, helping users make informed choices. The system empowers users to create a strategic action plan, focusing on continuous personal growth and future success through a well-rounded and informed decision-making process.

**Advantages**

1) **Personalized Decision-Making Support**: The platform provides tailored recommendations based on individual interests, skills, and values, helping users make informed decisions that align with their unique goals.

2) **Data-Driven Career Insights**: By analyzing job trends, salary potential, and market demand, the system offers valuable insights into career outlook, equipping users with practical information for future planning

3) **Enhanced Self-Awareness**: Through comprehensive self-assessment tools, users gain a deeper understanding of their strengths and preferences, empowering them to choose paths that resonate with their personal and professional aspirations.

4) **Efficient and Strategic Planning**: With a structured action plan, users can map out steps for achieving their degree and career objectives.

## 3.3FEASIBILITYSTUDY

The objective of feasibility study is not only to solve the problem but also to acquire asense of its scope. During the study, the problem definition was crystallized and aspects of the problem to be included in the system are determined. Consequently, benefits are estimated with greater accuracy at this stage. The key considerations are:

**1)** Technical feasibility

**2)** Economic feasibility

**3)** Operational feasibility

**4)** Legal and Ethical feasibility

**5)** Social feasibility

**Technical Feasibility:**

The project requires developing a user-friendly digital platform that integrates algorithms like K-Nearest Neighbor, K-Means Clustering, Bayesian Classifier, Decision Tree, Random Forest, and Support Vector Machine. These machine learning models are feasible given the current advancements in open-source machine learning libraries (e.g., TensorFlow, Scikit-Learn).

Required infrastructure includes a web-based or mobile interface for assessments and recommendations, a database for storing user data securely, and a backend system to run the machine learning models.

The project team must have expertise in data science, web development, and UI/UX design to ensure the system's robustness and usability.

**Economic Feasibility:**

Initial costs involve development, server hosting, algorithm training, and potentially, licensing fees for specialized software. However, costs can be minimized by using open-source software and cloud-based solutions.

Revenue generation could be achieved through subscription models, targeted ads, or partnerships with educational institutions and career counseling services.

The platform has potential for cost recovery and profitability, especially as demand for personalized career guidance grows.

**Operational Feasibility:**

The system provides a highly accessible and efficient tool for users, requiring minimal time and effort to conduct assessments and receive recommendations. This

aligns with user needs for accessible career guidance resources.
User engagement can be maintained through regular updates on job market trends, new degree programs, and personalized career guidance, fostering long-term platform relevance.

**Legal and Ethical Feasibility:**

Data privacy is a primary concern, as the platform will handle sensitive personal data.Compliance with data protection regulations (e.g., GDPR) is essential.
The system must ensure ethical use of data by providing transparent user data usage policies and options for data deletion to maintain user trust and meet legal standards.

**Social Feasibility**

1. **Accessibility and Inclusivity**:

The platform is designed to be accessible to a wide audience, including students from diverse backgrounds. By offering tailored guidance on degree programs and career paths, it promotes inclusivity and empowers users to make informed choices regardless of socioeconomic status or geographical location.

**2. Social Impact on Career Readiness**:

With rising competition in the job market, the platform provides users with the tools toassess their strengths, explore career options, and make strategic educational choices. This enhances career readiness among users, contributing to a more skilled and adaptable workforce that benefits society as a whole.

**3. Promoting Informed Decision-Making**:

The platform encourages users to make career and educational decisions based oncomprehensive self-assessment and real-world data, reducing the likelihood of regret or mismatches in career paths. This fosters a more satisfied and productive society by helping individuals pursue careers aligned with their interests and values.

**4. Support for Lifelong Learning and Development:**

By providing insights into career trends and growth opportunities, the platform encourages users to engage in lifelong learning and skill development. This contributes to a culture of continuous improvement and adaptability, essential for societal progress in an ever-evolving job market.

## 3.4 DEVELOPMENT ENVIRONMENT

### Hardware Requirements

Processor :Intel Core i5

RAM : 8 GB and above

HardDisk:256 GB SSD

Internet Connection:

Required for accessing

cloud-based services and

resources

### Software Requirements

Programming language: PYTHON

Technology: Machine Learning

Operating System : Windows 11

Tools: VS code/Google colab

Database: MySOL/MongoDB

# CHAPTER 4

# SYSTEM DESIGN

## 4.1 FLOW DIAGRAM

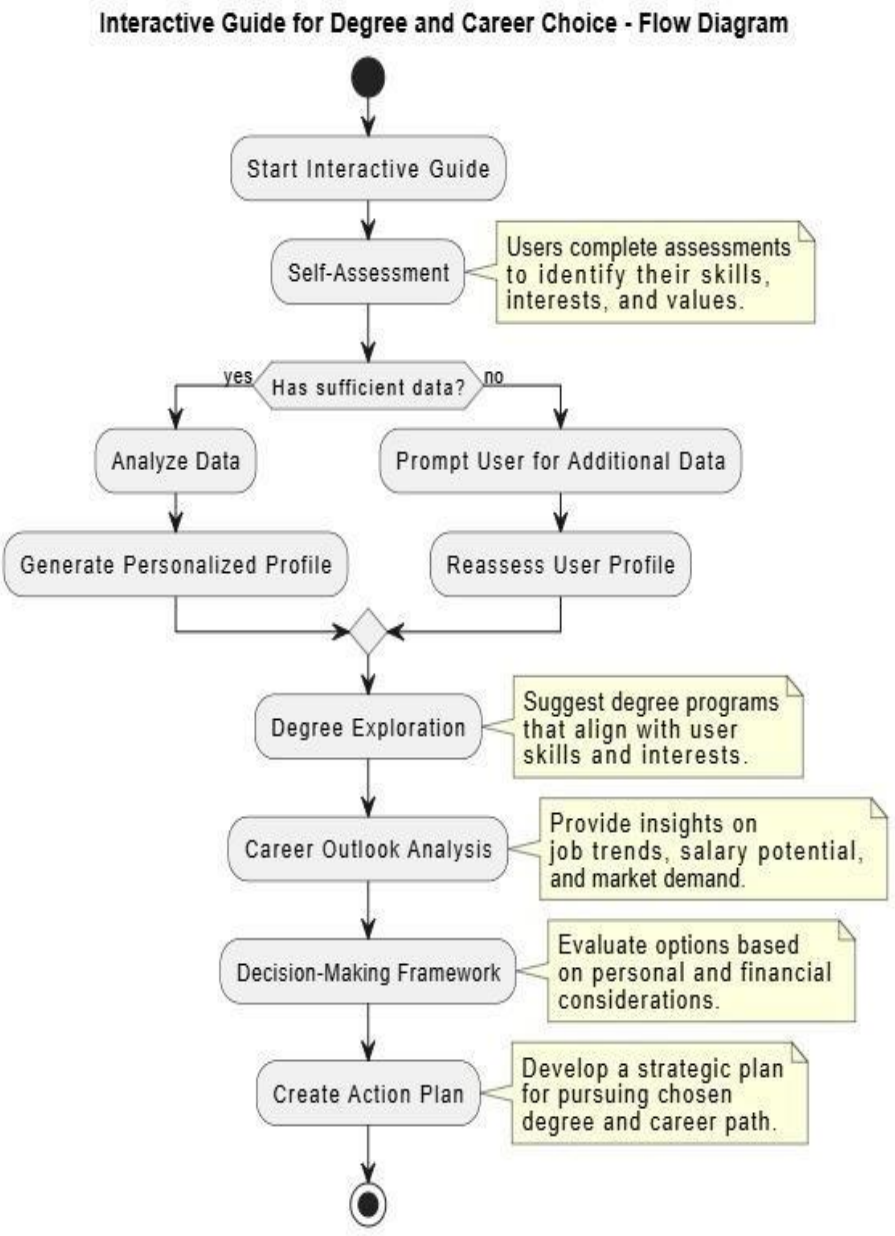


**Figure4.1**

This flow diagram illustrates the Interactive Guide for Degree and Career Choice project. Users begin with a self-assessment to identify their interests, skills, and values. After data analysis, personalized degree and career recommendations are provided. A decision-making framework helps users evaluate options, considering personal and financial factors. Finally, an action plan is generated to guide users in pursuing their chosen educational and career paths effectively.

## 4.2 DATASET

The dataset for the **Interactive Guide for Degree and Career Choice** system includes several essential components to provide accurate and personalized guidance for users. It incorporates **User Information**, containing fields such as a unique user ID, name, age, and contact details, to ensure proper identification and communication with the user.

The **Self-Assessment Details** section records responses related to user interests, skills, values, and learning preferences. These inputs help identify academic and career paths aligned with the user's profile, enhancing recommendation relevance.

In the **Educational Preferences** category, data fields include preferred subjects,desired degree types, and academic goals, providing insight into the user's academic aspirations. This section supports the system in suggesting degree programs that align with users' educational interests and goals.**Career Preferences** encompass desired industries, job roles, preferred work environments, and long-term career goals. This data helps the system align career recommendations with users' preferences and personal values, supporting their professional ambitions.

## 4.3 CLASS DIAGRAM

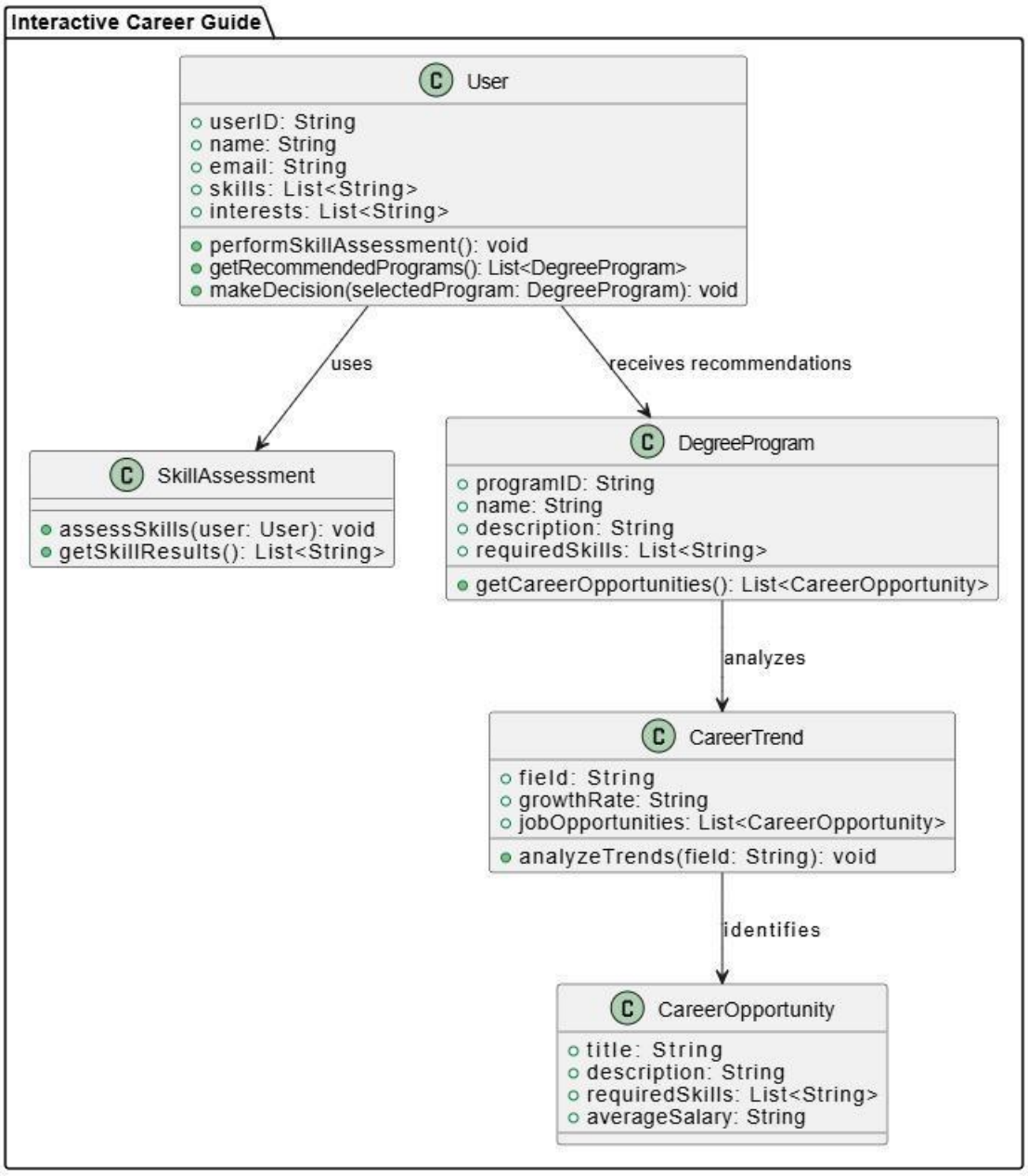


**Figure4.2 Class Diagram**

## 4.4 WORKFLOW DIAGRAM

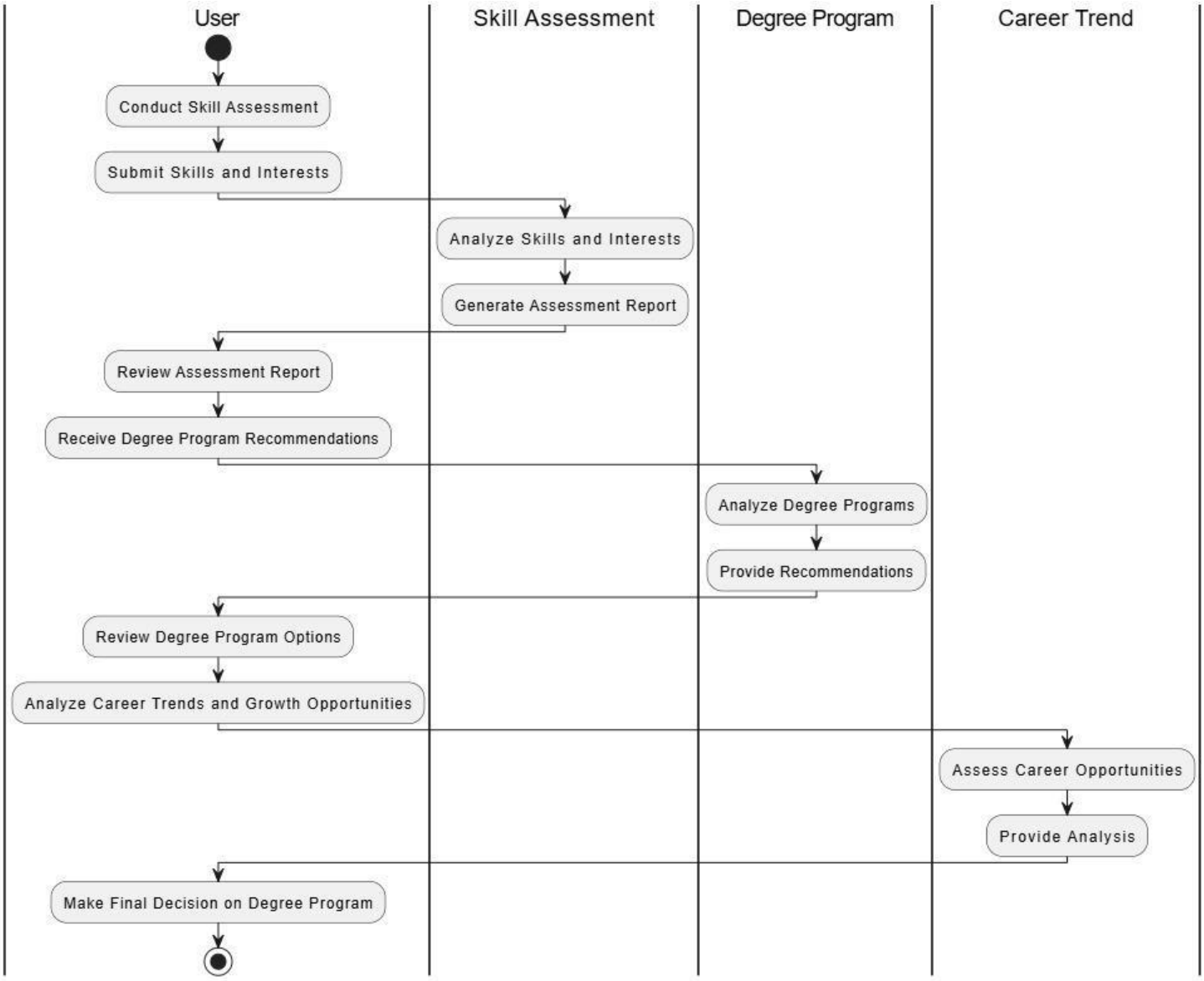


**Figure 4.3 Workflow Diagram**

## 4.5 SEQUENCE DIAGRAM

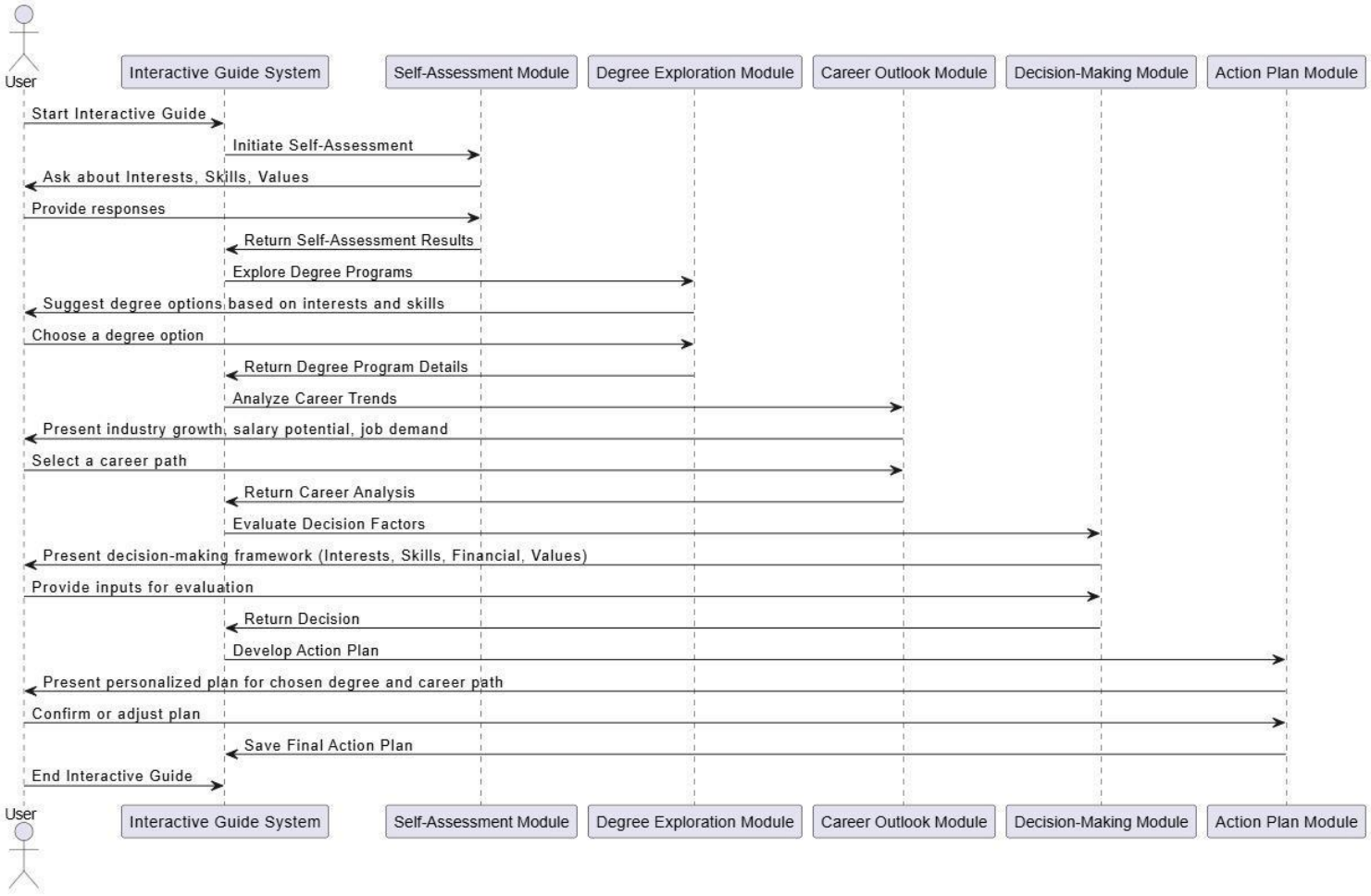


**Figure 4.4 Sequence diagram**

# CHAPTER 5

# SYSTEM ARCHITECTURE

## 5.1 ARCHITECTURE OVERVIEW

The architecture of the Interactive Guide for Degree and Career Choice consists offive core modules: Self-Assessment, Degree Exploration, Career Outlook, Decision- Making, and Action Planning, supported by a user interface and backend processing. The **Self-Assessment Module** initiates the process by analyzing user responses to assess interests, skills, and values. This data is then processed and sent to the **Degree Exploration Module**, which recommends degree programs aligned with user preferences, facilitating targeted academic exploration. The **Career Outlook Module** complements this by providing insights into job market trends, growth potential, and salary expectations, aiding in informed career selection.

Once data from these modules is compiled, the **Decision-Making Module** applies a structured framework, evaluating factors like personal interests, skills, financial feasibility, and values to guide the user towards an optimal choice. Finally, the **ActionPlan Module** generates a customized plan, outlining steps for pursuing the chosen path, which is presented to the user for review and adjustments. Each module communicates seamlessly, allowing real-time feedback and refinement. This integrated architecture enhances user decision-making, providing a structured path from self-discovery to career planning, tailored to empower informed and strategic future choices.

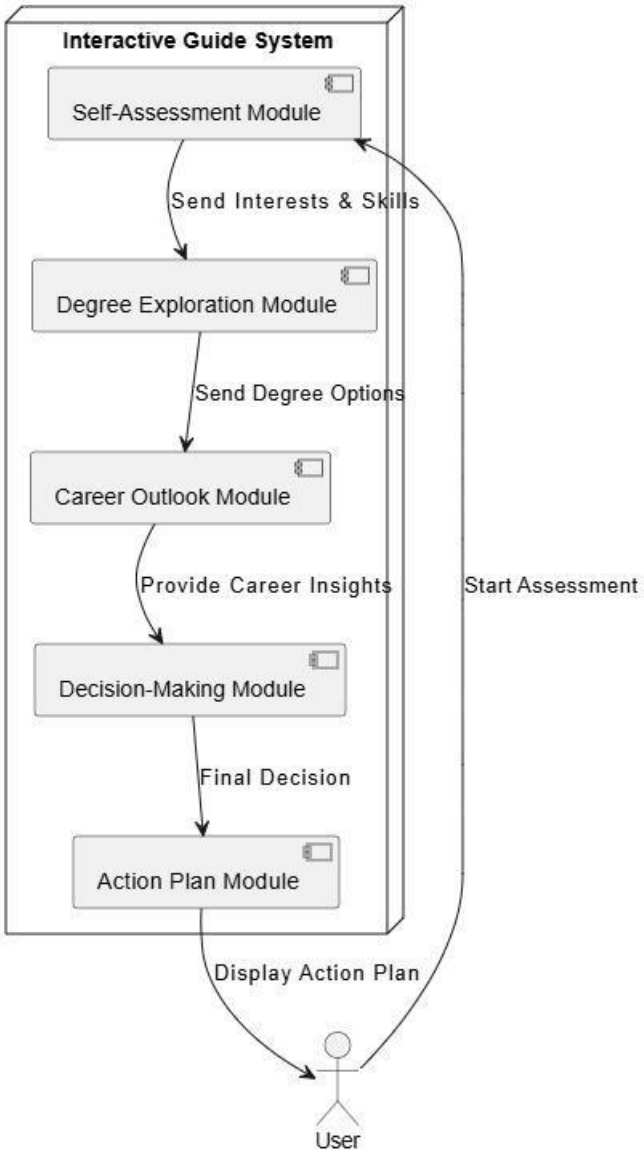


**Figure5.1 Architecture overview**

## 5.2 MODULES

### 1. User Module:

The **User Module** manages secure access within the interactive guide by verifyingand authorizing users. It requires login credentials, matching them with stored recordsto ensure only authorized access to personalized guidance features. For ease, the module includes options to view or hide passwords during entry, enhancing accuracy and user experience. It also manages access levels, providing different functionalities for users based on their roles—whether students, advisors, or administrators. With added features like session management, login history tracking, and password recovery, the User Module prioritizes both security and ease of use, enabling aseamless, protected experience.

**User Module**


**Figure 5.2 USER MODULE**

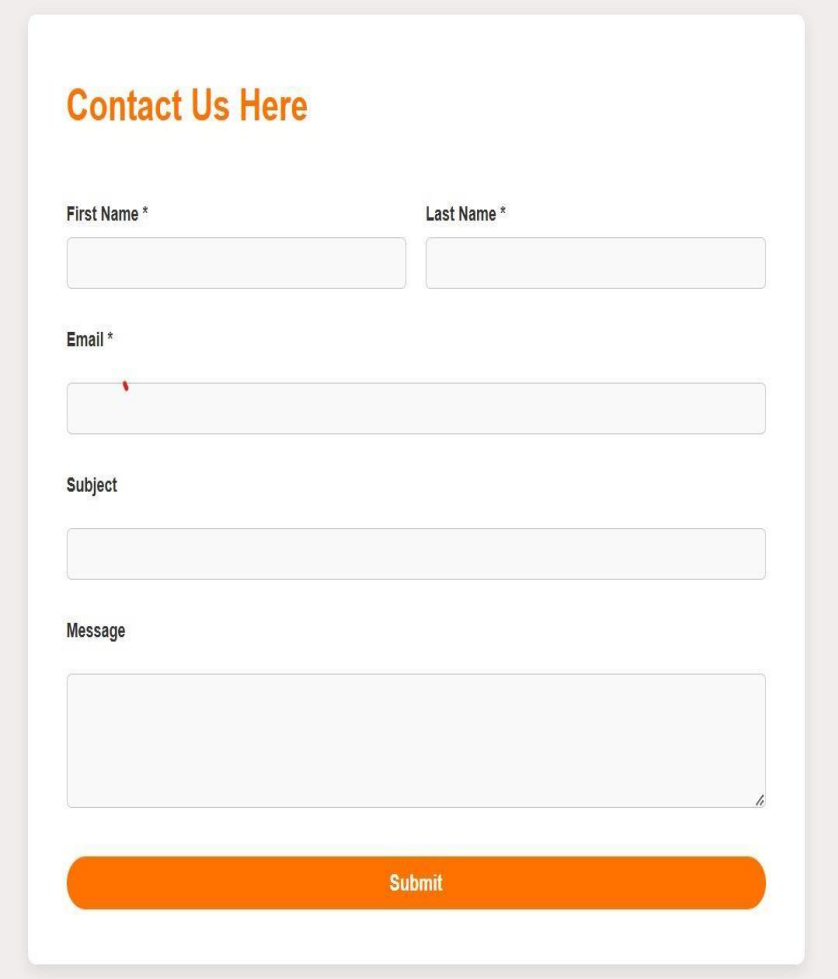


**Figure 5.2.1**

**2) Self-Assessment Module:**

The **Self-Assessment Module** is a foundational component of the *Interactive Guide for Degree and Career Choice*, dedicated to helping users gain insights into their personal interests, skills, and values. This module initiates the process by guiding users through a series of structured assessments, which are designed to capture a comprehensive view of their individual strengths, passions, and career-related preferences. Through a combination of questionnaires, skill tests, and interest-matching exercises, the Self-Assessment Module helps users develop a clearer understanding of the academic and career paths that align with their unique profiles.

The module is equipped with a user-friendly interface that presents questions in aclear and engaging format, allowing users to respond without feeling overwhelmed. Each question is designed to probe different aspects of the user's profile, such as subject preferences, activity interests, core competencies, and personal values. Responses are then processed using data analysis techniques to identify patterns, revealing areas where the user excels or shows strong inclinations. Once the assessments are completed, the Self-Assessment Module analyzes the data and categorizes the user's interests and skills into key thematic areas, such as sciences, arts, business, or technology. These categorizations are then fed into the Degree Exploration and Career Outlook Modules, where they help refine recommendations toensure that suggested degrees and careers closely match the user's preferences. By offering insights into their personal strengths and values, the Self-Assessment Moduleempowers users to make informed decisions throughout the career exploration process. It forms a critical first step, grounding the entire guide in the user's own attributes, which ensures that the recommendations provided are relevant, personalized, and aligned with their goals.

**3) Degree Exploration Module:**

The **Degree Exploration Module** in the *Interactive Guide for Degree and Career Choice* is designed to help users explore academic paths that align with their personal interests, skills, and long-term career aspirations. After the Self-Assessment Module identifies the user's strengths and preferences, the Degree Exploration Module leverages this information to recommend degree programs that offer relevant learning opportunities and pathways.

This module presents users with a curated list of degree options across diverse fields, such as science, technology, business, arts, and social sciences. For each

recommendation, the module provides details about the subjects covered, key skills developed, and potential career paths associated with the degree. Users can explore each option interactively, comparing degrees based on factors like curriculum, job prospects, and relevance to their personal goals.

To enhance the exploration process, the Degree Exploration Module integrates real-time data on academic trends and popular fields of study. This ensures that users receive up-to-date information about emerging disciplines and opportunities. The module may also use machine learning algorithms to match user profiles with ideal degrees, analyzing factors such as job market demand, growth potential, and industry relevance. This personalized approach helps users to discover fields they may not have considered but that fit well with their unique profiles. The module's user- friendly interface encourages users to filter degrees based on criteria like duration, location, and cost, allowing for a tailored exploration experience. Once users identify degrees of interest, they can save or revisit these options later in the decision-making process.

**4) Career Outlook Module:**

The **Career Outlook Module** provides insights into job trends, growth potential, and industry demands to support users in making informed career choices. It evaluates factors like average salaries, job market demand, and industry growth rates. This module helps users assess long-term career viability by presenting data on emerging opportunities, potential salary progression, and competitive job fields. By integrating real-time data and projected industry trends, the Career Outlook Module empowers users to choose career paths that align with their goals and respond to market demands, ultimately enhancing decision-making for a sustainable future.

**5) Decision-Making Module:**

The **Decision-Making Module** helps users evaluate their educational and career options using a structured framework that compares interests, skills, career outlook, financial considerations, and personal values. This module guides users in weighing each factor, offering visuals and comparative insights to aid in making well-informed choices that align with their goals. By focusing on key priorities—like job market trends, salary expectations, and alignment with personal values—the module enables users to make choices confidently. This systematic approach ensures that each decision reflects both practical needs and personal aspirations, supporting thoughtful career and academic planning

**DATASET**

**Table 5.3 Dataset details**

| User ID | Interests | Skills | Values | Preferred Degree | Suggested Career |
|---|---|---|---|---|---|
| 1 | Technology, Arts | Programming, Design | Creativity, Innovation | Computer Science | Software Developer |
| 2 | Science, Healthcare | Research, Empathy | Helpfulness, Integrity | Nursing | Registered Nurse |
| 3 | Business, Finance | Analysis, Communication | Leadership, Responsibility | Business Administration | Financial Analyst |
| 4 | Environment, Biology | Problem-Solving | Sustainability, Community | Environmental Science | Environmental Scientist |
| 5 | Education, Psychology | Teaching, Counseling | Support, Growth | Psychology | School Counselor |
| 6 | Arts, History | Writing, Critical Thinking | Expression, Tradition | History | Historian |
| 7 | Technology, Engineering | Engineering, Mathematics | Innovation, Precision | Mechanical Engineering | Mechanical Engineer |
| 8 | Sports, Fitness | Leadership, Coaching | Health, Teamwork | Physical Education | Fitness Trainer |
| 9 | Media, Communication | Public Speaking, Writing | Creativity, Influence | Communications | Public Relations Specialist |
| 10 | Technology, Gaming | Programming, Strategy | Creativity, Competition | Game Design | Game Developer |

## 5.3 ALGORITHMS

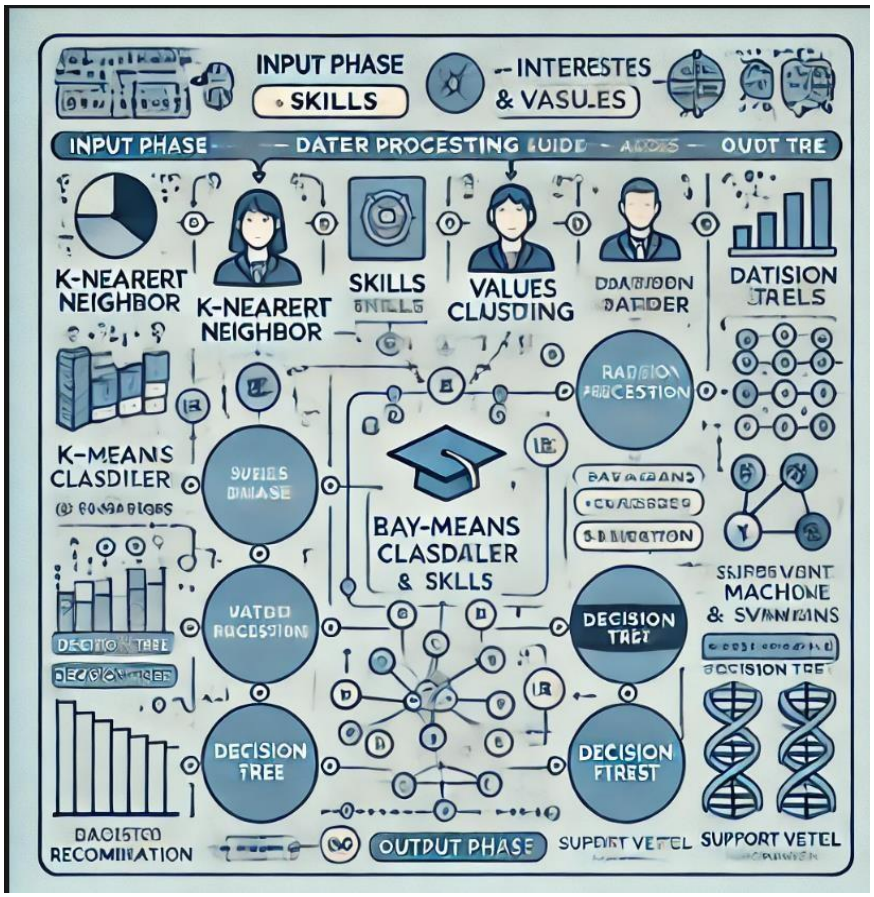


**Figure5.4**

### 1. K-Nearest Neighbor (KNN):

KNN is a classification algorithm that classifies a data point based on how its neighbors are classified. For your project, KNN identifies the most similar userprofiles based on interests and skills and suggests careers or degrees that match these profiles.

**2. K-Means Clustering**:

K-Means is an unsupervised clustering algorithm that groups data into clusters based on similarity. In this project, it groups users into clusters with similar skills and interests, which helps reveal popular career and degree trends within each cluster.

**3. Bayesian Classifier:**

This algorithm applies Bayes' theorem to classify data points by calculating the probability of a class given certain features. Here, it predicts career paths by using prior user data and matching user interests to probability-based classifications.

**4. Decision Tree(ID3 Algorithm):**

The Decision Tree uses a tree-like model where each decision node represents a question or criterion, helping split data into branches. The ID3 algorithm selects features that best split the data, allowing for a logical flow through various career or degree options based on users' responses.

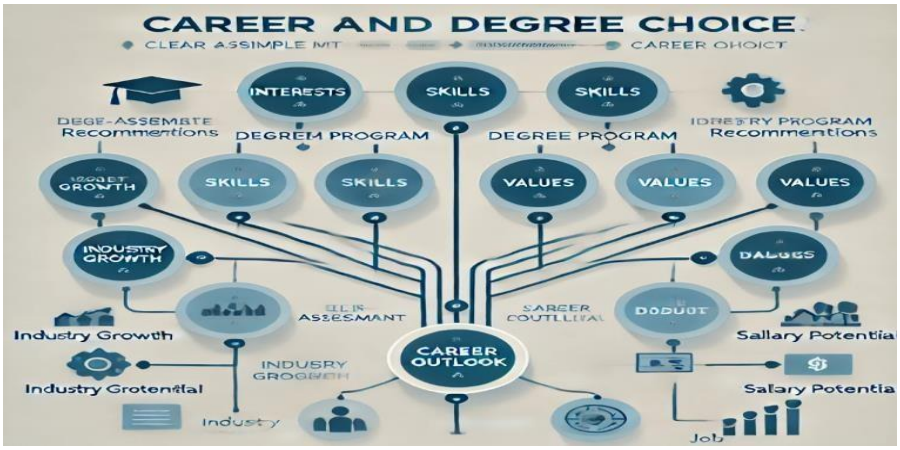


**Figure5.5**

**5. Random Forest:**

Random Forest is an ensemble method that combines multiple decision trees to improve classification accuracy. For your project, it builds various trees based on user data and picks the most common recommendation, giving more robust career and degree suggestions.

**6. Support Vector Machine:**

SVM is a supervised learning model that finds a hyperplane to separate data points into categories. In this context, SVM helps categorize users based on their skills and interests, aiding in distinguishing between different career or degree recommendations effectively.

Each algorithm plays a unique role, collectively enhancing the system's ability to offer personalized guidance based on comprehensive data analysis.

# CHAPTER 6

## SYSTEM IMPLEMENTATION

**University recommendations:**

```
import sys
import os
import collections
from collections import defaultdict
import matplotlib.pyplot as plt
import seaborn as sns
import numpy as np
import pandas as pd
from scipy import stats
import re
data= pd.read_csv(r"C:\Users\ASUS\Desktop\Final.csv")
data.shape
data.drop(data.columns[data.columns.str.contains('unnamed',case = False)],axis = 1, inplace =
True)
data.head()
data.columns = ['univName', 'major', 'program', 'season', 'decision', 'Method', 'decdate',
'decdate_ts', 'cgpa', 'greV', 'greQ',
        'greA', 'is_new_gre', 'gre_subject','status', 'post_data', 'post_timestamp', 'comments']
data.head()
data = data[data['decision'] =='Accepted']

data.shape
data = data[pd.notnull(data['greQ'])]
data.shape
data['greQ'] = data['greQ'].fillna(130)
data['greV'] = data['greV'].fillna(130)
data['greA'] = data['greA'].fillna(0)
data.greA.head()
uni_names = data['univName'].unique()

similar_univs = pd.DataFrame({'univName':uni_names})
similar_univs

data.describe()
```

```
def convert_quant_score(quant_score):
    quant_list = []
    quant_score = quant_score.tolist()
    for old_quant in quant_score:
        if old_quant <= 170:
            quant_list.append(old_quant)
            continue
        else:
            old_quant = old_quant/4.7
            if old_quant <=130:
                quant_list.append(130)
            else:
                quant_list.append(old_quant)
    return quant_list

def convert_verbal_score(verbal_score):
    verbal_list = []
    verbal_score = verbal_score.tolist()
    for old_verbal in verbal_score:
        if old_verbal <= 170:
            verbal_list.append(old_verbal)
            continue
        else:
            old_verbal = old_verbal/4.7
            if old_verbal <=130:
                verbal_list.append(130)
            else:
                verbal_list.append(old_verbal)
    return verbal_list

data['greQ'] = convert_quant_score(data['greQ'])
data['greV'] = convert_verbal_score(data['greV'])
sns.pairplot(data, palette="husl", x_vars=["greV","cgpa","greQ"],
y_vars=["greV","cgpa","greQ"], height=8)
plt.show()

def normalize_gpa(data2,cgpa,totalcgpa):
    cgpa = data2[cgpa].tolist()
    totalcgpa = data2[totalcgpa].tolist()
    for i in range(len(cgpa)):
```

```
        if totalcgpa[i] != 0:
            cgpa[i] = cgpa[i] / totalcgpa[i]
        else:
            cgpa[i] = 0
    data2['cgpa'] = cgpa
    return data2

data =  data.drop('major',1)
data = data.drop('program',1)
data = data.drop('season',1)
data = data.drop('decision',1)
data = data.drop('Method',1)
data = data.drop('decdate',1)
data = data.drop('decdate_ts',1)
data = data.drop('is_new_gre',1)
data = data.drop('gre_subject',1)
data = data.drop('status',1)
data = data.drop('post_data',1)
data = data.drop('post_timestamp',1)
data = data.drop('comments',1)

university_list = list(set(data['univName'].tolist()))
for i in range(len(university_list)):
    if(len(data[data['univName'] == university_list[i]]) < 100):
            data = data[data['univName'] != university_list[i]]
data = data.dropna()

data.head()

processed_data = data[['greV', 'greQ', 'greA', 'cgpa', 'univName']]
processed_data.head()

processed_data.to_csv('./data/csv/Processed_data.csv')

import math
from sklearn import neighbors, datasets
from numpy.random import permutation
import matplotlib.pyplot as plt
from sklearn import svm
from sklearn.ensemble import RandomForestClassifier
```

```
from sklearn.metrics import precision_recall_fscore_support

random_indices = permutation(data.index)
test_cutoff = math.floor(len(data)/5)
print(test_cutoff)
test = processed_data.loc[random_indices[1:test_cutoff]]
train = processed_data.loc[random_indices[test_cutoff:]]
train_output_data = train['univName']
print("train Output data", train_output_data)
train_input_data = train
train_input_data = train_input_data.drop('univName',1)
print("train input data", train_input_data)
test_output_data = test['univName']
print("test Output data", test_output_data)
test_input_data = test
test_input_data = test_input_data.drop('univName',1)
print("test input data", test_input_data)

def euclideanDistance(data1, data2, length):
    distance = 0
    for x in range(length):
        distance += np.square(data1[x] - data2[x])
    return np.sqrt(distance)

def knn(trainingSet, testInstance, k):
    print(k)
    distances = {}
    sort = {}
    length = testInstance.shape[1]

    for x in range(len(trainingSet)):

        dist = euclideanDistance(testInstance, trainingSet.iloc[x], length)

        distances[x] = dist[0]

    sorted_d = sorted(distances.items(), key=lambda x: x[1])


    neighbors = []
```

```
    for x in range(k):
        neighbors.append(sorted_d[x][0])

    classVotes = {}

    for x in range(len(neighbors)):
        response = trainingSet.iloc[neighbors[x]][-1]
        if response in classVotes:
            classVotes[response] += 1
        else:
            classVotes[response] = 1

    sortedVotes = sorted(classVotes.items(), key=lambda x: x[1], reverse=True)

    return(sortedVotes, neighbors)
testSet = [[142, 153, 5.0, 3.6]]
test = pd.DataFrame(testSet)
test.shape

k = 7

result,neigh= knn(data, test, k)

list1 = []
list2 = []
for i in result:
    list1.append(i[0])
    list2.append(i[1])
for i in list1:
    print(i)

from sklearn.neighbors import KNeighborsClassifier
neigh = KNeighborsClassifier(n_neighbors=5)
neigh.fit(data.iloc[:,0:4], data['univName'])

print(neigh.predict(test))
```

## College recommendation:

```
import pandas as pd
from tabulate import tabulate


file_path = '/mnt/data/engineering colleges in India.csv'
data = pd.read_csv(r"C:\Users\ASUS\Desktop\engineering colleges in India.csv")

data['Rating'] = pd.to_numeric(data['Rating'], errors='coerce')
data['Average Fees'] = pd.to_numeric(data['Average Fees'], errors='coerce')

data_cleaned = data.dropna(subset=['Rating', 'Average Fees', 'Total Student Enrollments', 'Total Faculty'])

data_cleaned['Total Student Enrollments'] = pd.to_numeric(data_cleaned['Total Student Enrollments'], errors='coerce')
data_cleaned['Total Faculty'] = pd.to_numeric(data_cleaned['Total Faculty'], errors='coerce')

data_cleaned['Faculty_Student_Ratio'] = data_cleaned['Total Faculty'] / data_cleaned['Total Student Enrollments']

data_cleaned['Rating_Rank'] = data_cleaned['Rating'].rank(ascending=False)
data_cleaned['Faculty_Student_Ratio_Rank'] =
data_cleaned['Faculty_Student_Ratio'].rank(ascending=False)
data_cleaned['Fees_Rank'] = data_cleaned['Average Fees'].rank(ascending=True)
```

```
data_cleaned['Combined_Score'] = data_cleaned[['Rating_Rank', 'Faculty_Student_Ratio_Rank',
'Fees_Rank']].mean(axis=1)

top_tamilnadu_colleges = data_cleaned[data_cleaned['State'] == 'Tamil
Nadu'].sort_values('Combined_Score').head(10)

print(tabulate(top_tamilnadu_colleges[['College Name', 'City', 'Rating', 'Average Fees',
'Faculty_Student_Ratio', 'Combined_Score']],
              headers='keys', tablefmt='grid'))
```

**Career Analysis:**

```
#import libraries
import pandas as pd
from sklearn.preprocessing import LabelEncoder
import numpy as np
data= pd.read_csv(r"C:\Users\ASUS\Downloads\stud.csv")

data.shape
pd.set_option('display.max_columns',None)
pd.set_option('display.max_rows',None)

data.head(6)

data.info()

data.isnull().sum()
```

```
label_encoder = LabelEncoder()

data['Courses_label'] = label_encoder.fit_transform(data['Courses'])


data['Courses_label'].value_counts()
y=data['Courses_label']

categorical_columns = ['Drawing','Dancing','Singing','Sports','Video
Game','Acting','Travelling','Gardening','Animals','Photography','Teaching','Exercise','Coding','Elec
tricity Components','Mechanic Parts','Computer Parts','Researching','Architecture','Historic
Collection','Botany','Zoology','Physics','Accounting','Economics','Sociology','Geography','Psycolo
gy','History','Science','Bussiness
Education','Chemistry','Mathematics','Biology','Makeup','Designing','Content
writing','Crafting','Literature','Reading','Cartooning','Debating','Asrtology','Hindi','French','English'
,'Urdu','Other Language','Solving
Puzzles','Gymnastics','Yoga','Engeeniering','Doctor','Pharmisist','Cycling','Knitting','Director','Jour
nalism','Bussiness','Listening Music']  # Replace with your categorical columns


label_encoders = {}

for col in categorical_columns:
    label_encoder = LabelEncoder()
    data[col] = label_encoder.fit_transform(data[col])
    label_encoders[col] = label_encoder
```

```
dataab=data.drop(['Courses'],axis=1)# drop course column after encoding
dataab.head()

X=['Drawing','Dancing','Singing','Sports','Video
Game','Acting','Travelling','Gardening','Animals','Photography','Teaching','Exercise','Coding','Elec
tricity Components','Mechanic Parts','Computer Parts','Researching','Architecture','Historic
Collection','Botany','Zoology','Physics','Accounting','Economics','Sociology','Geography','Psycolo
gy','History','Science','Bussiness
Education','Chemistry','Mathematics','Biology','Makeup','Designing','Content
writing','Crafting','Literature','Reading','Cartooning','Debating','Asrtology','Hindi','French','English'
,'Urdu','Other Language','Solving
Puzzles','Gymnastics','Yoga','Engeeniering','Doctor','Pharmisist','Cycling','Knitting','Director','Jour
nalism','Bussiness','Listening Music']

X_df = dataab[X]

Y = dataab['Courses_label']

X=['Drawing','Dancing','Singing','Sports','Video
Game','Acting','Travelling','Gardening','Animals','Photography','Teaching','Exercise','Coding','Elec
tricity Components','Mechanic Parts','Computer Parts','Researching','Architecture','Historic
Collection','Botany','Zoology','Physics','Accounting','Economics','Sociology','Geography','Psycolo
gy','History','Science','Bussiness
Education','Chemistry','Mathematics','Biology','Makeup','Designing','Content
writing','Crafting','Literature','Reading','Cartooning','Debating','Asrtology','Hindi','French','English'
,'Urdu','Other Language','Solving
```

```
Puzzles','Gymnastics','Yoga','Engeeniering','Doctor','Pharmisist','Cycling','Knitting','Director','Jour
nalism','Bussiness','Listening Music']

X_df = dataab[X]

Y = dataab['Courses_label']

import joblib

joblib.dump(model , 'model .pkl')
import joblib

loaded_model = joblib.load('model .pkl')

user_input = {}
feature_names=['Drawing','Dancing','Singing','Sports','Video
Game','Acting','Travelling','Gardening','Animals','Photography','Teaching','Exercise','Coding','Elec
tricity Components','Mechanic Parts','Computer Parts','Researching','Architecture','Historic
Collection','Botany','Zoology','Physics','Accounting','Economics','Sociology','Geography','Psycolo
gy','History','Science','Bussiness
Education','Chemistry','Mathematics','Biology','Makeup','Designing','Content
writing','Crafting','Literature','Reading','Cartooning','Debating','Asrtology','Hindi','French','English'
,'Urdu','Other Language','Solving
Puzzles','Gymnastics','Yoga','Engeeniering','Doctor','Pharmisist','Cycling','Knitting','Director','Jour
nalism','Bussiness','Listening Music']

for feature in feature_names:
```

```
    user_value = float(input(f"Enter value for {feature} (0 or 1): "))
    user_input[feature] = user_value
user_data = pd.DataFrame([user_input])

missing_columns = set(X_train.columns) - set(user_data.columns)
for column in missing_columns:
    user_data[column] = 0  # Add missing columns and set them to 0

prediction = model.predict(user_data)

numeric_to_category = {
    0: 'Animation, Graphics and Multimedia',
    1: 'B.Arch- Bachelor of Architecture',
    2: 'B.Com- Bachelor of Commerce',
    3: 'B.Ed.',
    4: 'B.Sc- Applied Geology',
    5: 'B.Sc- Nursing',
    6: 'B.Sc. Chemistry',
    7: 'B.Sc. Mathematics',
    8: 'B.Sc.- Information Technology',
    9: 'B.Sc.- Physics',
    10: 'B.Tech.-Civil Engineering',
    11: 'B.Tech.-Computer Science and Engineering',
    12: 'B.Tech.-Electrical and Electronics Engineering',
    13: 'B.Tech.-Electronics and Communication Engineering',
    14: 'B.Tech.-Mechanical Engineering',
    15: 'BA in Economics',
```

```
    16: 'BA in English',
    17: 'BA in Hindi',
    18: 'BA in History',
    19: 'BBA- Bachelor of Business Administration',
    20: 'BBS- Bachelor of Business Studies',
    21: 'BCA- Bachelor of Computer Applications',
    22: 'BDS- Bachelor of Dental Surgery',
    23: 'BEM- Bachelor of Event Management',
    24: 'BFD- Bachelor of Fashion Designing',
    25: 'BJMC- Bachelor of Journalism and Mass Communication',
    26: 'BPharma- Bachelor of Pharmacy',
    27: 'BTTM- Bachelor of Travel and Tourism Management',
    28: 'BVA- Bachelor of Visual Arts',
    29: 'CA- Chartered Accountancy',
    30: 'CS- Company Secretary',
    31: 'Civil Services',
    32: 'Diploma in Dramatic Arts',
    33: 'Integrated Law Course- BA + LL.B',
    34: 'MBBS'
   }
prediction = model.predict(user_data)

numeric_prediction = prediction[0]

if numeric_prediction in numeric_to_category:
    categorical_prediction = numeric_to_category[numeric_prediction]

print("i sugest you to go with ", categorical_prediction)
```

# CHAPTER 7

# EXPERIMENTAL ANALYSIS

## 7.1 Self-Assessment Accuracy Testing:

The objective of self-assessment accuracy testing is to validate how well the system identifies and categorizes users' interests, skills, and values. This step involves gathering a diverse group of participants, such as students with varied academic and professional backgrounds, to ensure a representative sample. Each participant completes the self-assessment module, which categorizes their responses to recommend suitable degree and career paths. Metrics such as *precision* of recommendations (percentage of correct matches) and *user feedback* are essential here. User feedback surveys will determine if participants feel that the recommendations align with their stated interests and skills. A high accuracy rate— targeting 80-90% alignment—would confirm the reliability of the self-assessment module, establishing a foundation for further system recommendations.

## 7.2 Degree Exploration Validity:

The degree exploration component assesses the system's ability to suggest degree programs that correspond with users' interests. This phase of testing involves presenting users with questions designed to highlight specific interests and recording the system's degree suggestions based on their responses. Theexperiment includes testing the **K-Means Clustering** algorithm used to groupsimilar interests, ensuring logical and relevant matches for degree options. Key metrics in this section include the *relevance score*, rated on a 1-5 scale, and the *clustering quality*, assessed using silhouette scores or other validity measures to

confirm that the clusters represent cohesive academic groups. By achieving clear and accurate groupings, the system will effectively guide users to degrees that closely align with their interests and aptitudes.

### 7.3 Career Trend Analysis Performance:

Career trend analysis is critical for delivering accurate and up-to-date insights into job market demand, salary potential, and industry growth. The experiment involves testing the system's trend analysis against real-world labor data and salary statisticsto confirm alignment with actual industry trends. Additionally, users are asked to select potential careers based on these insights, and their selections are compared tothe system's career suggestions to check for alignment. Metrics include the *accuracy of trend data* (measured against labor market databases) and *user confidence* in the insights provided, gauged through surveys. The goal is to provide reliable and informative career trends, helping users make informed decisions with confidence in the data provided.

### 7.4 Decision-Making Support Validation:

This component evaluates the system's effectiveness in guiding users through decision-making, balancing factors like personal values, financial considerations, and job outlook. Simulation testing is conducted by presenting hypothetical scenarios with diverse interest profiles, values, and financial backgrounds to see if the system's suggestions align with expected results. User interaction data, such as the time taken to finalize decisions and the level of satisfaction with the information provided, are essential for assessing system performance. Metrics include *decision confidence*, measured by user feedback on whether the system gave adequate support, and *consistency in decision quality*, ensuring similar inputs yield reliable outcomes. The expected result is a high

satisfaction rate, with 70-80% of users indicating they felt confident in their decisions due to the guidance offered.

### 7.5 Overall System Usability Testing:

The usability testing phase aims to measure system performance, accessibility, and ease of use. This experiment involves a cross-section of users with different technical skills to ensure the system is intuitive for all user levels. Performance monitoring tracks response times, particularly for resource-intensive processes like career trend analysis. Metrics include *task completion time*, which measures the duration users needto complete the assessment process, and *error rate*, noting any occurrences of misclassification or mismatches. Additionally, user feedback on overall satisfaction, clarity, and navigation ease will provide insights into the user experience. The target outcome is high user satisfaction, minimal delays, and an error rate below 5%, indicating a well-optimized, user-friendly system.

**Graph Analysis:**

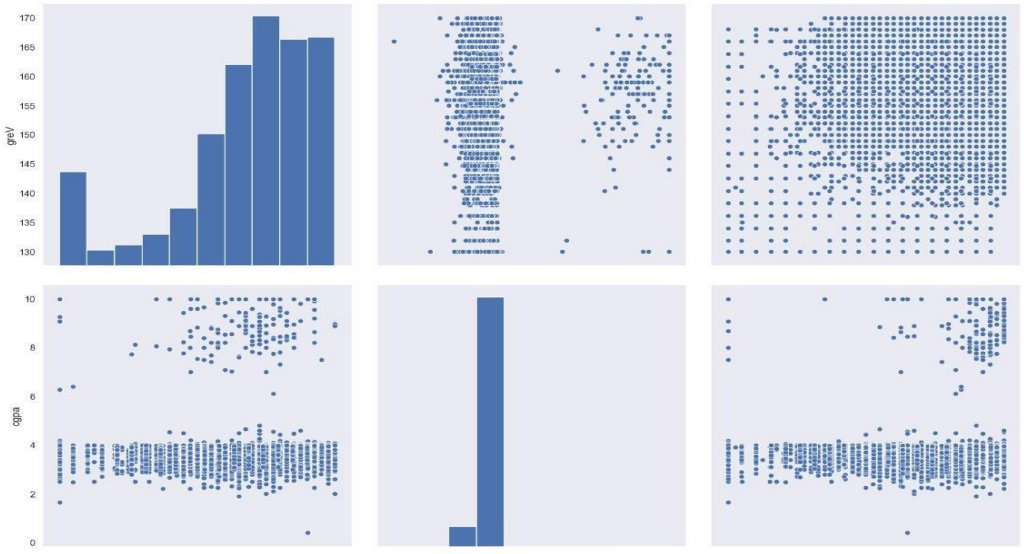


**Figure7.1 Graph analysis**

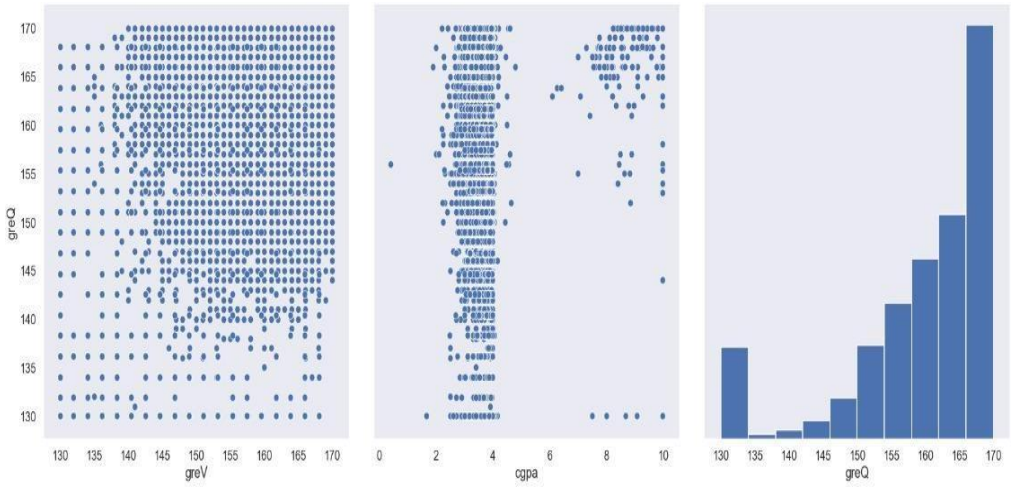
greQ
170
165
160
155
150
145
140
135
130
130 135 140 145 150 155 160 165 170
greV
0 2 4 6 8 10
cgpa
130 135 140 145 150 155 160 165 170
greQ

**Figure7.2**

# CHAPTER 8

# CONCLUSION

This project, *The Interactive Guide for Degree and Career Choice,* provides anessential roadmap for individuals navigating the pivotal decisions of selecting a degree and career path. This guide is not merely informational; it is a transformative tool designed to foster self-awareness, enable informed decision-making, and encourage strategic planning, offering a structured approach to self-discovery and career exploration.

The project addresses several core objectives critical to empowering users in their career and educational journey. Central to this guide is the emphasis on self-assessment, guiding individuals to reflect on their strengths, interests, skills, and values. This process of self-discovery forms the foundation for all subsequent steps, encouraging users to consider what genuinely drives them and how their unique skills can translate into meaningful career paths. By offering a comprehensive framework for users to assess their intrinsic motivations, the guide fosters a deep understanding of personal priorities, values, and capabilities, equipping individuals with the clarity needed to pursue a purposeful career and academic trajectory.

Moreover, the project presents a robust methodology for exploring degree programs aligned with the user's passions and skills. This stage ensures that users consider a range of academic options tailored to their interests and encourages them to evaluate how each program aligns with potential career opportunities. To enhance this exploration, the guide integrates data-driven algorithms, including K-Nearest Neighbors (KNN), K-Means Clustering, Bayesian Classifier, Decision Tree, and Support Vector Machine, among others.

These algorithms allow users to receive recommendations based on an analysis of similar profiles, providing a personalized approach that adds significant value to the decision-making process. By leveraging these advanced algorithms, the guide notonly introduces users to academic fields that complement their strengths but also lays a strong technical foundation for intelligent and individualized recommendations.

An integral aspect of this guide is its focus on career trends and growth opportunities. By researching industry growth, job demand, and salary potential, users gain insight into the viability of their chosen career path. This strategic planning aspect is criticalin today's rapidly evolving job market, where career landscapes are influenced by technological advancements and shifting economic priorities. Equipped with this information, users can make informed choices about which industries offersustainable career opportunities, where their potential for growth and stability lies,and how they can align their education with in-demand skill sets. This forward- thinking approach empowers users to set realistic expectations and pursue fields that align with both their interests and long-term career goals.

Financial considerations and personal values are also prioritized within the guide, addressing essential aspects of decision-making that extend beyond academic and career alignment. By assessing the financial feasibility of educational choices, users can plan responsibly, ensuring that their career decisions support both their personal aspirations and practical constraints. Additionally, the guide encourages users toreflect on their values, fostering alignment between their career choices and what theydeem important in life—such as work-life balance, job security, and ethical considerations in their chosen field. This holistic approach ensures that users are not only choosing a viable career path but also one that resonates deeply with their sense of purpose and personal values.

Overall, this project offers a comprehensive framework for individuals navigating thecomplex intersection of education and career. It supports users through each step,from self-awareness and degree exploration to career trend analysis and final decision-making, transforming a typically overwhelming process into a structured, empowering journey. The interactive nature of this guide fosters engagement, enabling users to take control of their future with confidence and clarity. In combining data-driven technology with practical, values-oriented advice, the project equips users to make choices that are well-informed, personally fulfilling, and strategically sound.

In conclusion, *The Interactive Guide for Degree and Career Choice* stands as a vital resource for anyone embarking on their educational and career journey. It not only provides a roadmap to navigate personal growth and career decisions but also embodies a commitment to empowering individuals to take charge of their futures. By fostering self-discovery, enabling informed choices, and encouraging strategic planning, this guide supports users in building successful and fulfilling careers.

# APPENDICES

## A.1 SAMPLE SCREENSHOTS

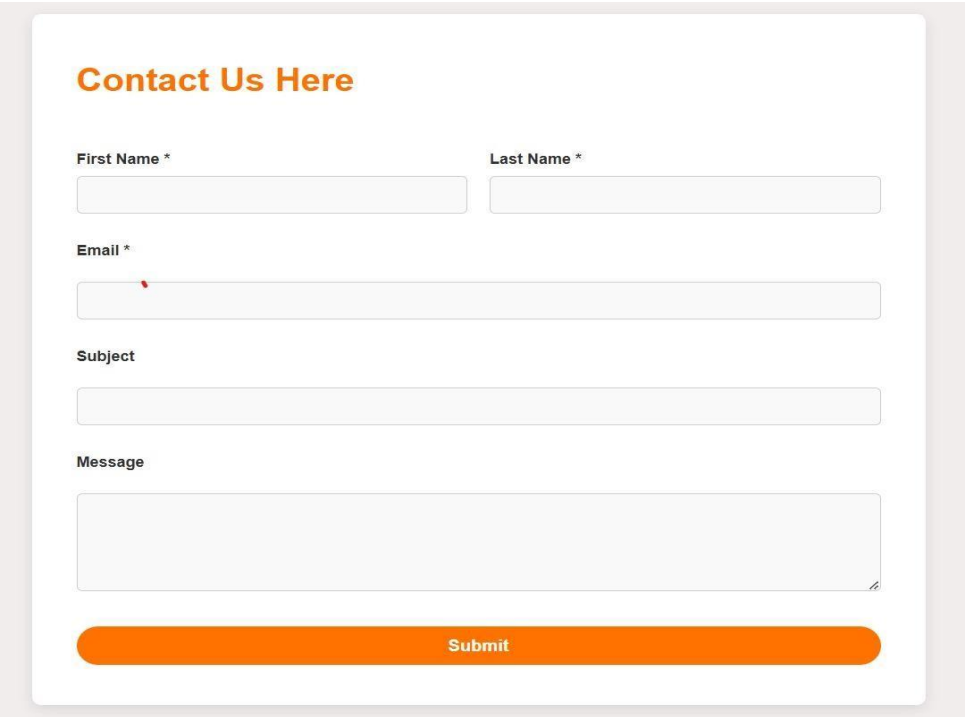


**Figure8.1**

**LOGINPAGE**


**Figure8.2**

## University recommendation

In [16]:
```
data.drop(data.columns[data.columns.str.contains('unnamed',case = False)],axis = 1, inplace = True)
data.head()
```

Out[16]:

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | University Of Waterloo | Systems Design Engineering | MS | NaN | Accepted | Website | (1, 7, 2019) | 1.561964e+09 | NaN | NaN | NaN | NaN | NaN | NaN | International | ( 20 |
| 1 | Northeastern University | Electrical Engineering | PhD | F19 | Rejected | Website | (8, 7, 2019) | 1.562569e+09 | NaN | NaN | NaN | NaN | NaN | NaN | NaN | ( 20 |
| 2 | The University Of Auckland | Electrical And Electronic Engineering | MS | NaN | Accepted | Website | (19, 6, 2019) | 1.560928e+09 | NaN | NaN | NaN | NaN | NaN | NaN | International | (9, 20 |
| 3 | Radford University | Counseling Psychology PsyD. | Other | F19 | Accepted | Phone | (4, 3, 2019) | 1.551686e+09 | NaN | NaN | NaN | NaN | NaN | NaN | American | (9, 20 |
| 4 | University Of Chittagong | Computer Science | MS | NaN | NaN | Other | (9, 7, 2019) | 1.562656e+09 | 3.2 | 163.0 | 168.0 | 4.0 | True | NaN | International | (9, 20 |

**Figure8.3**

## College Recommendation:

[7]:

| | College Name | City | State | Rating | Average Fees | Faculty_Student_Ratio | Combined_Score |
|---|---|---|---|---|---|---|---|
| 149 | Jawaharlal Nehru Centre for Advanced Scientifi... | Bengaluru | Karnataka | 3.76 | 5120.000000 | 0.126506 | 7.333333 |
| 502 | Homi Bhabha National Institute | Mumbai | Maharashtra | 3.53 | 81422.500000 | 0.448630 | 22.333333 |
| 63 | University of Hyderabad | Hyderabad | Telangana | 3.72 | 53266.017699 | 0.093228 | 25.333333 |
| 56 | Jawaharlal Nehru University | New Delhi | Delhi | 3.77 | 17570.000000 | 0.083787 | 27.166667 |
| 332 | Rajarajeswari College of Engineering | Bengaluru | Karnataka | 3.37 | 140615.384615 | 0.100225 | 55.666667 |
| 920 | North Eastern Hill University | Shillong | Meghalaya | 3.20 | 94120.645161 | 0.106809 | 57.666667 |
| 372 | Sri Sai Ram Engineering College | Chennai | Tamil Nadu | 3.37 | 147777.777778 | 0.086027 | 67.333333 |
| 617 | Karpagam College of Engineering | Coimbatore | Tamil Nadu | 3.32 | 154727.272727 | 0.092501 | 68.666667 |
| 32 | Thiagarajar College of Engineering | Madurai | Tamil Nadu | 3.47 | 130524.736842 | 0.074170 | 69.666667 |
| 759 | Sri Sai Ram Institute of Technology | Chennai | Tamil Nadu | 3.30 | 147142.857143 | 0.086664 | 71.666667 |

**Figure8.4**

**Career Analysis:**

| | 0 | 1 |
|---|---|---|
| 0 | Database Fundamentals | Computer Architecture |
| 1 | Professional | Not Interested |
| 2 | Professional | Poor |
| 3 | Professional | Beginner |
| 4 | Professional | Average |

| | 2 | 3 | 4 |
|---|---|---|---|
| 0 | Distributed Computing Systems | Cyber Security | Networking |
| 1 | Not Interested | Not Interested | Not Interested |
| 2 | Not Interested | Not Interested | Not Interested |
| 3 | Not Interested | Not Interested | Not Interested |
| 4 | Not Interested | Not Interested | Not Interested |

| | 5 | 6 | 7 |
|---|---|---|---|
| 0 | Software Development | Programming Skills | Project Management |
| 1 | Not Interested | Not Interested | Not Interested |
| 2 | Not Interested | Not Interested | Not Interested |
| 3 | Not Interested | Not Interested | Not Interested |
| 4 | Not Interested | Not Interested | Not Interested |

| | 8 | 9 | 10 |
|---|---|---|---|
| 0 | Computer Forensics Fundamentals | Technical Communication | AI ML |
| 1 | Not Interested | Not Interested | Not Interested |
| 2 | Not Interested | Not Interested | Not Interested |
| 3 | Not Interested | Not Interested | Not Interested |
| 4 | Not Interested | Not Interested | Not Interested |

| | 11 | 12 | 13 |
|---|---|---|---|
| 0 | Software Engineering | Business Analysis | Communication skills |
| 1 | Not Interested | Not Interested | Not Interested |
| 2 | Not Interested | Not Interested | Not Interested |

**Figure8.5**

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