**SYNOPSIS REPORT ON**

Career Recommendation System

*Submitted in partial fulfillment of the requirements for the award of the degree of*

**BACHELOR OF COMPUTER APPLICATIONS**

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**Batch: 2021 - 24**

***Under the Guidance of Submitted By***

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Table of Contents

[1. Problem Statement 3](#_Toc147262940)

[2. Objectives and Scope 4](#_Toc147262941)

[3. Methodology 5](#_Toc147262942)

[4. Hardware and Software Used 6](#_Toc147262943)

[5. Resources and Limitations 7](#_Toc147262944)

[6. Testing Methodology 8](#_Toc147262945)

[7. Conclusions 9](#_Toc147262946)

# **1. Problem Statement**

**1.1. Problem**

* The project aims to tackle the absence of a structured decision-making framework for students following their 10th-grade examinations. Students often lack systematic guidance in selecting academic courses or streams that align with their academic performance, interests, and strengths, consequently impacting their career prospects.

**1.2. Background**

* In the current educational landscape, the career selection process remains a significant challenge for students. The lack of tailored guidance and the complexities of aligning academic performance with career aspirations necessitate an innovative solution.

**1.3. Relevance**

* The project is highly pertinent in today's educational context, as it seeks to address the critical issue of career decision-making for students. The system's ability to provide personalized recommendations and address subject weaknesses is profoundly relevant to improving academic and career trajectories.

# **2. Objectives and Scope**

* **Objectives:**
  + Develop a machine learning-driven recommendation system that analyzes students' academic performance, interests, strengths, and career aspirations which provides course, stream, and career recommendations based on content filtering.
  + Identify and address subject-specific weaknesses that may hinder students' chosen career paths.
  + Implement a user-friendly questionnaire to refine recommendations based on user tendencies and make further recommendations on things of their interest that they lack awareness of or even provide new things to get interested in for those who have exhausted their option.
  + Suggest improvement strategies: For subjects in which students are weak, the system will offer tailored recommendations on strengthening their skills and improving their performance.
* **Scope:**
  + The project's scope encompasses providing students with informed career recommendations following their 10th-grade examinations.
  + Recommendations are personalized through an in-depth analysis of academic data, interests, and subject weaknesses.
  + Strategies to enhance proficiency in relevant subjects are offered.
  + A user-centric questionnaire refines recommendations by evaluating user inclinations.

# **3. Methodology**

* **Data Collection:** Procure academic performance metrics, interest assessments, and career objectives from student records.
* **Machine Learning Model:** Develop a machine learning model incorporating academic performance, interests, and strengths/weaknesses as feature inputs.
* **Recommendation Generation:** Utilize the model's filtering to generate individualized course or stream recommendations for each student.
* **Improvement Suggestions:** For students with subject-specific weaknesses, provide targeted strategies and resources to enhance their proficiency.
* **Questionnaire:** To refine further recommendations based on user tendencies and on things of their interest that they lack awareness of or even provide new things to get interested in for those who have exhausted their option.
* **User Interface:** Construct a user-friendly interface enabling students to input their information and receive personalized recommendations.

# **4. Hardware and Software Used**

* **Hardware Requirements:**
  + RAM: 4 Gb minimum
  + Storage: 100 mb minimum
* **Software Requirements:**
  + Operating system platform- atleast windows 10
  + Database management system- SQLite
  + Programming languages – Python
  + Machine learning libraries and frameworks – sci-kit learn
  + Data analysis tools – Pandas, NumPy, Matplotlib, seaborn
  + GUI generation libraries: PyQT5
  + IDEs: Python IDE, Anaconda Jupyter

# **5. Resources and Limitations**

* **Resources:**
  + Programming Language libraries suitable for making good UI for computer applications.
  + Access to diverse data sources, including academic records and questionnaire responses.
  + Availability of hardware and software infrastructure.
  + Robust testing and quality assurance resources;
  + Educational resources and content for suggesting improvement strategies.
* **Limitations:**
  + Recommendations are contingent on self-assessment, potentially overlooking external factors.
  + Recommendation precision hinges on the quality and comprehensiveness of data.
  + Ongoing updates to recommendations may be necessitated by evolving career trends.
  + User engagement is dependent on the capabilities of the system.

# **6. Testing Methodology**

The testing methodology employed for this project is Manual Testing, utilizing White-Box Testing techniques.

Testing Process: The testing process encompasses the following steps:

* Requirements Analysis: Review and analysis of project documentation to identify testing objectives and requirements.
* Test Case Development: Creation of test cases tailored to the identified objectives and requirements.
* Manual Testing: Execution of test cases through manual processes.
* Bug Identification: The process of identifying and documenting defects or issues encountered during manual testing.

Completion Criteria: The testing process is considered complete when all identified test cases have been executed, and no further defects or bugs are found.

# **7. Conclusions**

* The "Career Recommendation System" project endeavors to address the pressing issue of post-secondary and pre-secondary career decision-making. The system provides individualized recommendations and guidance by leveraging academic performance, interests, strengths, and career aspirations. The project holds profound significance in the educational domain and stands to significantly enhance students' academic and vocational journeys.