**SYNOPSIS ON**

Career Recommendation System

*Submitted in partial fulfilment 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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# **1. Problem Statement**

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* 1. **Problem:**

The "Career Recommendation System" project addresses a pressing issue in the educational landscape, primarily concerning students transitioning from their 10th-grade examinations. At this critical juncture, students often find themselves at a crossroads, faced with the formidable task of choosing academic courses or streams that will significantly shape their future careers. However, the educational system currently lacks a structured and comprehensive decision-making framework to guide students through this crucial phase of their academic journey.

In particular, students grapple with several challenges:

* **Lack of Systematic Guidance:** The absence of a systematic guidance system leaves many students in the dark, unsure of which path to follow. Without clear direction, they may make ill-informed decisions that can impact their career prospects for years to come.
* **Balancing Performance and Aspirations:** Striking the right balance between their academic performance, personal interests, and inherent strengths is a complex and often bewildering task. Students must align their educational choices with their career aspirations, a process that is far from straightforward.

As a result, many students are left navigating this critical decision-making process with minimal support or personalized advice. This lack of guidance can have profound consequences on their educational and career trajectories, potentially leading to mismatches between their chosen paths and their true potential.

* 1. **Background:**

The existing educational framework has long grappled with the challenge of equipping students with the tools and knowledge necessary to make informed career choices. Traditionally, students have relied on a mix of limited resources, including career counsellors and educational advisors, which often fall short of providing the personalized guidance needed.

The complexities of aligning academic performance, personal interests, and career goals further exacerbate the problem. The evolving job market demands that students choose their paths with care, as they prepare for careers in fields that are continually changing and diversifying. Consequently, there is a growing need for an innovative solution that addresses these challenges effectively.

* 1. **Relevance:**

The "Career Recommendation System" project is profoundly relevant in the context of today's educational landscape. It directly addresses the critical issue of career decision-making for students, offering a tailored and data-driven approach to support their academic and vocational aspirations. Several key aspects underline the system's relevance:

* **Personalized Recommendations:** By leveraging data on academic performance, personal interests, and strengths, the system provides personalized course and career recommendations. This tailoring ensures that students are directed toward paths that genuinely resonate with their capabilities and aspirations.
* **Subject Weakness Mitigation:** The system goes a step further by diagnosing subject-specific weaknesses. This critical feature empowers students to address these weaknesses and bolster their educational foundations, thereby enhancing their chances of success in their chosen careers.
* **Improved Academic and Career Trajectories:** The project holds the potential to significantly improve students' academic and career trajectories. By offering precise, data-driven recommendations, it helps students make more informed decisions, reducing the likelihood of misaligned choices.

**2. Objectives and Scope**

* 1. **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.
  1. **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**

* 1. **Hardware Requirements:**
* RAM: 4 Gb minimum
* Storage: 464 mb minimum
  1. **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**

* 1. **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.
  1. **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 Developmen**t: 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 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.