

# Career Recommendation

**A Minor Project Synopsis**  
**Submitted to Prof. Priyanka Jangde**



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## Abstract

In today's changing world with evolving new technologies it is important for students to make the right career decision . Students in our country often take the wrong career path by getting influenced by others and regretting it afterwards. There is no proper guidance for them on choosing their subjects or courses. As the number of choices can be overwhelming there is a need to filter , prioritize and efficiently deliver the best solution for the problem , therefore we are making a recommendation system to predict the best career option for students based on their skills and interest among the available wide range of choices. This project is a part in progress of education towards better course recommendation. We use a machine learning program that asks the client questions, and recommends the better stream based on the skills and academic performance provided.

## Introduction

The significant growth in the amount of available digital information and the numerous career path that are available at today's date have created a potential challenge for students to make a firm decision ,as the number of choices increases the confusion to choose the right decision also increases. So, the recommendation system helps the student to explore fields related to education and career opportunities that are available. It narrows down the information based on their interest and makes it easy for them to select their next step.

Recommender Systems is an application of machine learning in which the model learns from the given data and hence proposes a new recommendation. The recommendation system gives the option to comprehend an individual's taste and find the new, appropriate choice for them consequently. However individuals' preferences shift, they do-follow patterns. Individuals will in-general like things which are comparable to social individual preferences. Our aim is to make a career recommendation system to help students in making a better decision for their future.

The student career guidance system can be used by the student to select the best suited career path based on their unique qualities, strengths and weaknesses. This software can help students to select their career path without putting in more effort. Nowadays the number of related study fields is available which makes the student confused to avoid their problems. We developed this software. The software will recommend only the basis of student response and then follow the same as the previous one . if the student is selected correctly the system will predict the related study fields which would be the final suggestion of the student. a further student wants to change the study field then fill the required details . The number of related study programs is continuously increasing, if further decomposition of study fields into specific sub-fields might be necessary in order to have more specialized fields of study. .

Our project is meant to help students make decisions . We use a machine learning program that asks the students questions, and recommends the better stream based on the skills and academic performance provided. Machine learning provides a better ability to upscale, upgrade and obtain results than hard coded algorithms. A machine learning model is an entity that understands the problem – this is

obviously better for non-deterministic, real world problems like recommender systems, compared to a pre-programmed system that can do nothing but go by the book. Intuitively, ML is the right approach for this problem, and we have made use of the same.

## Objective

Career choice is a critical moment for any student. Our main objective is to provide the best career option for students on the basis of their skills, hobbies, areas of interest and skill. We are making a recommendation system with the help of machine learning models like collaborative filtering. So, the recommendation system helps the student to explore fields related to education and career opportunities that are available. It narrows down the information based on their interest and makes it easy for them to select their next step. Individual's educational needs will differ on their career objectives and skills.

## Scope of the project

This project is made for all the individual who are taking the next step for their futures. This project is gonna help:

- Higher secondary students who need to make the best possible career choice for their future and proceed in that direction.
- Individuals who are trying to start a new career as they may be tired of their current situation.
- People who are starting their career very late because they may not be able to build their career at early age maybe cause of poor financial status or our society norms for example generally women who are still repressed at some corner of our country

## Study of existing system

Traditional career counseling is done at a career center wherein the person has to give many aptitude tests, which are then scored manually. These scores are then reviewed by a career counselor who then assigns you a career stream. This whole process is long, tiresome and error prone. Our system automates this process, resulting in a better error-free career recommendation system, since our recommendation algorithm also takes into account the user's personality, which is a very important factor when deciding someone's career. Aptitude & Academic/Technical skills alone are not the only deciding factor when it comes to a career decision, Personality and Aptitude both are important.

Career Recommendation devised a model for a system that would help students in identifying characteristics that affect their success in the first year and created an optimal algorithm to predict students' academic performance. To create classification models and an artificial neural network function, researchers used the WEKA tool. It has been discovered that students' backgrounds have an impact on their performance, and it is advised that the necessary tactics be used to go around them.

It suggested a method for using a user recommendation system to analyze educational data to assess students' performance. They compared it to logistic Regression analysis for intelligent tutoring. Improvement in prediction is apparent in experimental outcomes.

If sufficient counseling is not given prior to selection, there may be a mismatch between the student profile and their chosen course. Failures and a low retention rate result from this.

The Student Recommendation System is one such programme. By using clustering techniques, this system reports correlations between student history and results. They assist students in locating engaging courses relevant to their interests, which lowers retention, boosts satisfaction, and improves placements.

The researchers utilized ensemble approaches in addition to using individual machine learning techniques, and then compared the outcomes between the two. The best outcomes were produced through decision trees. The researchers also paid attention to behavioral traits. A model both with and without these components was created. It was discovered that adding behavioral factors enhanced the accuracy of the predictions.

## **Project Description**

The proposed model is a machine learning model that generates recommendations' using recommender systems concept of machine learning by analyzing the huge amounts of data assembled using big data technologies. The model would be divided into three major phases of development. The three models clearly define the process of data collection, analysis, classification & recommendation. The model analyzes the metrics in a very curated way and could suggest the user or an organization with a recommendation that could be early advice and could help in making better decisions at a given point of time. Also, it would result in making the required changes to achieve the goal even before starting the process so that there are no errors in the early phases of the process.

The model proposed creates a bridge between educational institutions and organizations where data particular to a similar user and their proposed metric are evaluated and established. Since the data is ever recurring hence the probability of using big data to analyze and hold that data is mandatory. The data that was already collected by the present-day learning management systems and other useful softwares both from educational institutions and other companies are evaluated, cleaned and then set the stage for the upcoming platform to generate new data and then combine it. The model starts by accumulating all the data that it has been collecting using various learning management softwares and then are stored using the big data methodologies so that at a later point of time they can be retrieved for analysis. Then the data is divided concerning two databases: User data and the company-specific data which is evaluated and then the states are formulated. In the next phase the data which is collected undergoes content and collaborative filtering in which the data is compared to many similar metrics and hence is classified according to its similarities. The data is then prone to the regression models where it is filtered and then is sent to the database with filtered metrics. In the next phase when we retrieve the information that we analyzed in the previous phase and stored in the database is now displayed back according to the need of the user or the company.

## Methodology

To develop the recommendation system , we have divided the process in the following phases :

### 1. Data Collection

- Student's details like subjects, activities, student hobbies, subject mark etc. Are getting it during student form filling.
- Stored those data into the database.

### 2. Data Analysis

- Select the student area of interest and get all the subjects with marks.
- Administrators already assigned courses for each subject.
- Students choose physics, math, chemistry subjects and compare them with threshold values.
- If student got above threshold value means suggest that engineer as career
- Otherwise the system goes for the next category and so on.

### 3. Post Analysis and Report Generation

After the analysis appropriate recommendation of a particular domain or career choice listing out all the possibilities of success rates in percentile for that particular field of domain and comparing it with the profile of the user concerning a similar database.

## Resources and Limitations

### Software Requirements:

Front-end : HTML, CSS, Javascript, Bootstrap

Back-end :Python

Database : MongoDB (It's a No SQL database)

### Limitations:

The Student Recommendation System is one such programme. By using clustering techniques, this system reports correlations between student history and results. They assist students in locating engaging courses relevant to their interests, which lowers retention, boosts satisfaction, and improves placements.

But like any other amazing invention it has its own limitations such as:

- The model can only make recommendations based on the existing interest of a user. In other words, the model has limited ability to expand on the user's existing interests.
- In a item based model, Side Feature Doesn't have much importance. Here Side features can be student names or parents name in the context of career recommendation system.

## Conclusion

This project presents Student Career Guidance and Recommendation System using the inherent student skills for choosing the right career. Choosing a right career is significant due to the diversified human abilities. Many students are choosing their career path without receiving proper advice from suitable professional or university services. This may potentially cause mismatch between academic achievements, personality, interest and abilities of the students. In order to recommend students in career selection, it is essential to build a recommendation system that provides direction and guidance to students in choosing their career. The key challenge in this project is selecting key attributes/skills that help in predicting the right path to meet diversified students goals.

Here, we have developed a software tool to evaluate the aptitude and personality of a person based on his/her academic level using carefully curated personality and aptitude tests. This tool will help you determine your aptitude and personality traits, and will eventually help you in choosing your own career path.

## Future Scope

In the future, we can develop efficient web applications that can collect data by analyzing and assessing it. Testing methods that can be used to increase accuracy include analytical, memory-based, technical, logical, hobbies, interests in technical and non-technical fields, student performance going back to early childhood, and skill-based examinations. The dataset may be created using data from thousands of students. To have a better understanding, we can attempt to employ clustering approaches. We can also use methods like Time series analysis and Deep Neural Networks.

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