

CAREER GUIDANCE SYSTEM BY USING KNN ALGORITHM

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Abstract - Career choice plays an important role in college student's life planning. In today's world choosing the right career is the toughest decision. Today many students are confused about their future. They do possess some skills but they are not able to identify their abilities and a proper domain. Different people suggest different career options but at last, the student has to select their career. In this project, basically we have focused on this problem of the engineering student using machine learning. With the help of machine learning, we are helping the student to decide which is the best career option and domain for them using different machine learning techniques. The career is decided based on academic information filled by the student. This project helps the student to get directed towards a specific domain as per their skills. Over the past few years several systems have been built to help engineering students select the right career path by predicting the best career option based on their academic factors. However, academic factors are not the only relevant factor, we do need to consider one's cognitive abilities and psychometric factors too; such as, speed, learning capacity, endurance and memory to achieve the best career outcomes. However, in order to develop a system that will predict one's career based on both academic and psychometric factors we need to select a classification algorithm like K-nearest neighbors (KNN) that will provide the best accuracy rate.

Key words: Career Guidance, Machine Learning Algorithms, K-Nearest Neighbor, Web Development.

1. INTRODUCTION

Career guidance can be described as a process through which engineering students become familiar with various career options, job opportunities and are prepared for those opportunities. Career counselling is the approach that will allow the engineering student to understand their options, find his best skills and get acquainted with the world of work in order to make choices about employment, education and life. Competition in today's society is heavily multiplying day by day. It is too hard in the present day to face the technical world. So as to complete and reach the goal of engineering students, they need to be planned

and organized from the initial and final stages of their education. So it's important to perpetually assess their performance, establish their interests and assess how close they're to their goal and assess whether or not they are within the right path that directs towards their target. This helps them in improving themselves, motivating themselves to a better career path if their capabilities are not up to the mark to reach their goal and prevalue themselves before going to the career peak point. Not only that, recruiters while recruiting people into their companies evaluate candidates on different parameters and draw a final conclusion to select an employee or not and if selected, finds a relevant stream and career area for engineering student. There are many types of roles like Database administrator, Business Process Analyst, Developer, Testing Manager, Networks Manager, Data scientist and so on. All these roles require some prerequisite knowledge in them to be placed in them. So, recruiters analyze candidates' performance in skills, talents and interests and place the candidate in the right job role suited for them. These kinds of prediction systems make their recruitment tasks very easy because as the inputs are given, recommendation is done based on inputs. Though the career counselors may assist the students many times it would be difficult for them to completely understand the inclination of the engineering students, academics and thus the counseling process may be limited. Also, not all engineering students would be privileged to avail of such facilities. Globally there are some attempts in this area, but we need to work on this area for our students. academics and thus the counseling process may be limited. Also, not all students would be privileged to avail of such facilities. Globally there are some attempts in this area, but we need to work on this area for our students Hence we would be working on the web-based application, henceforth referred to as "Intelligent Career Guidance System".

2. LITERATURE SURVEY

Many machine learning techniques have been applied to develop prediction algorithms. There are mainly two issues while developing this sort of model one is whether the student is willing to build his career based on his interests and compassions and whether the student has proper identification of improving his Skills by pursuing certification courses based on the interests of the students.

So questionnaires are developed in this model that must classify the reflections of the student outcomes. We are doing a comprehensive study of the career-related aspects including the current situation, opportunities, and possible options. This would involve surveys with specific questionnaires, interviews with the relevant industry leaders, reference materials, etc. According to Watts and Fretwell generally, the aim of Career Guidance is to help students make decisions based on their interests, passion, and abilities, while taking into account current and future career opportunities. Students are encouraged to learn more about the world of work across different industries so that they may take the right steps to obtain their objectives and goals/aspirations. Another perspective indicated that Career guidance can be referred to as services and activities intended to assist individuals, of any age and at any point throughout their lives, to make educational, training, and occupational choices and to manage their career. “Career guidance” denotes systematic programs that facilitate individual career development and career management. Behdad Bankshinategh, Gerasimos Spanakis, Osmar Zaiane, and Samira ElAtia Pal conducted a study in India, to determine factors that most heavily affected student performance. They first utilized the classic Collaborative Filtering (CF) method for their study for achieving various goals in their research. They have used these algorithms on the real-time data sets but it is done on data mining and some tools are weak for mining the data. A second challenge lies with the scalability of the algorithm. To have a reasonable response time for making recommendations to a high number of students might raise the need to include new techniques. In this challenge the also tried matrix factorization will be explored, as well as explore how performance can be boosted. However, since this research focuses on predicting student academic motivation using data mining methods and only, this review of literature presents only the results from several relevant studies that have used diverse predictors available from different files and various methods for predicting academic motivation within the online learning environment.

3. OBJECTIVE

In the modern age, choosing the right career option is a very tough assignment for students. In the last decade, the number of career options increased tremendously. Most of the engineering students are even unaware of

these career options. Many career counsellor platforms charge high fees which are not affordable for everyone. so there is a need for a career counselling website which is free and user friendly. The main objective of our system is to provide right guidance to the students by recommending the appropriate career. Along with this our system also gives brief insights to the students about the recommended career option.

4. STSTEM ARCHITECTURE

End User: This is the interface that interacts with users through screens, forms, menus, reports, etc. It is the most visible layer of the application. It defines how the application looks. In this layer client can send request to web server as per required.

Web layer: This is the topmost level of the application. The web layer displays information related to such services as browsing information, purchasing and visual effect contents. It communicates with other tiers by which it puts out the results to the browser/client tier and all other tiers in the network. In simple terms, it is a layer which users can access directly (such as a web page, or an operating system’s GUI).

Application layer: The Application Core holds the business model, which includes entities, services, and interfaces. These interfaces include abstractions for operations that will be performed using Infrastructure, such as data access, file system access, network calls, etc. Sometimes services or interfaces defined at this layer will need to work with non-entity types that have no dependencies on UI or Infrastructure. These can be defined as simple Data Transfer Objects (DTOs).

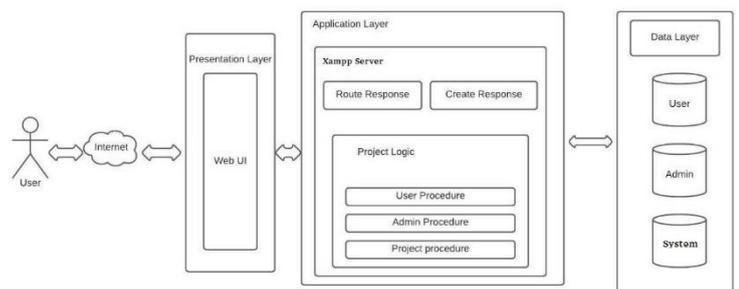


Fig 1.1: System Architecture

5. USE CASE DIAGRAM

Registration and Login: The students would be registered through a very simple method either by email id or Mobile number. The login credentials would be created and would be validated through every login attempt. Students Can See

Various Fields.

Discover yourself: This section would enable the students to take a few tests to discover themselves in terms of their ability, interests, inclination, future plans etc. This would create a student profile which would be used as a baseline for suggesting the possible career options. We will leverage the AI ML techniques to predict the way forward.

Data Preprocessing: Data Preprocessing we preprocess the data into required format. For Example, the data in data set will be stored in the form of words, nothing but alphabetic. We convert those into numerical format.

Predicting the Skills: Predicting the Skills from the Data By applying various machine algorithms on the data set, we found more accuracy. At any one algorithm, thus it suits for the recommendation system to be accurate. **Recommend the respected skill:** Then Recommend the respected skill Individual students differ from the other students in their skills. Recommendation system helps to predict the inherent skill of a student and recommend the respected skill courses.

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

Daily bytes: This would be displayed as a daily important tip to create interest among the students and to spend time to leverage this platform.

Links to important information: This section would contain important informational links and the students can be redirected to these links.

6. ALGORITHM- KNN

K-nearest neighbors (KNN) algorithm is a type of supervised ML algorithm which can be used for both classification as well as regression predictive problems. The K-NN algorithm assumes the similarity between the new case/data and available cases and puts the new case into the category that is most similar to the available categories. K-NN algorithm stores all the available data and classifies a new data point based on the similarity. This means when new data appears then it can be easily classified into a well suited category by using K- NN algorithm. K-NN is a non-parametric algorithm, which means it does not make any assumption on underlying data. The K-NN working can be explained on the basis of the below algorithm:

- Step-1: Select the number K of the neighbors
- Step-2: Calculate the Euclidean distance of K number of neighbors
- Step-3: Take the K nearest neighbors as per the calculated Euclidean distance.
- Step-4: Among these k neighbors, count the number of the data points in each category.
- Step-5: Assign the new data points to that category for which the number of the neighbor is maximum.
- Step-6: Our model is ready.

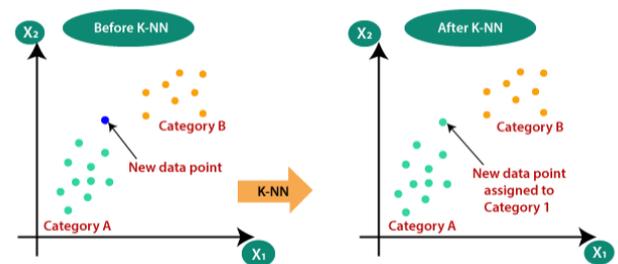


Fig 1.3: KNN Algorithm

7. SYSTEM DESIGN

METHODOLOGY:

Registration and Login: The students would be registered through a very simple method either by email id or Mobile number. The login credentials would be created and would be validated through every login attempt. Students Can See Various Fields.

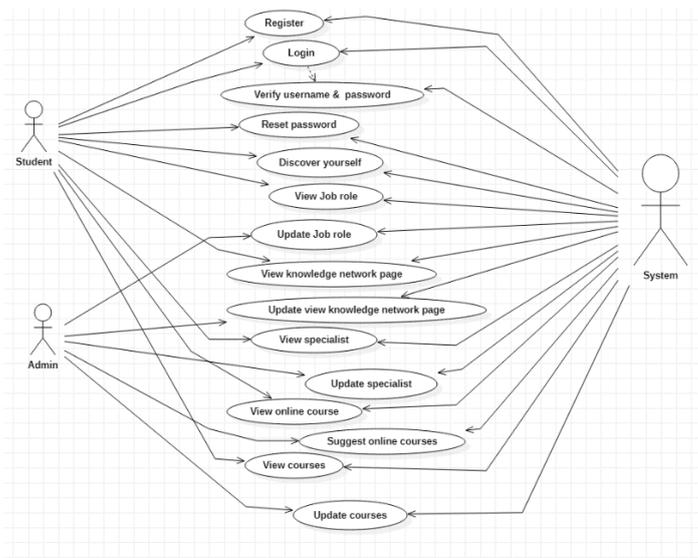


Fig 1.2: Use Case Diagram

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8.RESULTS

Now here are the snapshot of intelligent career guidance system. In this section, we are discussing through some of the snapshot of project.

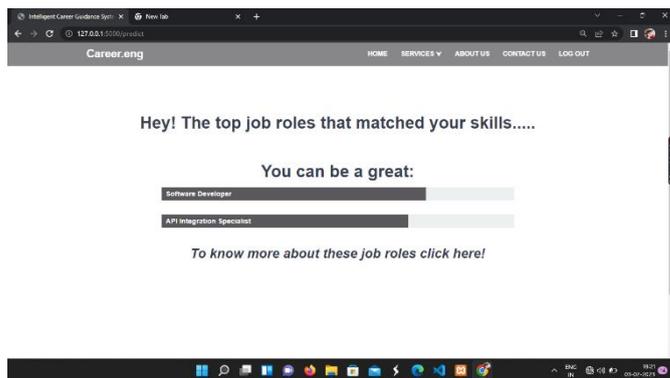


Fig 1.4: Final Result

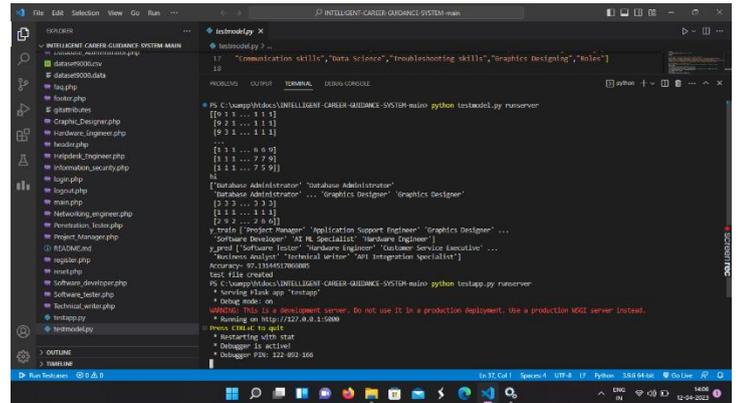


Fig 1.5: Accuracy

9.CONCLUSION

It helps students to increase the chances for selecting the best carrier. Students Chances of failure may decreases because they select the carrier as per their interest and skills. To generate the best carrier prediction, knowledge network and get more courses related to their field.

10.FUTURE SCOPE

As the Education system is emerging day by day due to the internet we can provide tutorials, learning videos, assignments, ebooks on our website. The scope of the website can be further expanded by providing guidance to Engineering students, also our website will provide the list of colleges along with the cut offs and number of seats available.

11. DATASET

Dataset: SANIKA

In this dataset there are total 9180 entries .

There are 17 columns in this dataset: Database Fundamentals, Computer Architecture, Distributed Computing Systems, Cyber Security, Networking, Development, Programming Skills, Project Management, Computer Forensics Fundamental, Technical Communication, AI ML, Software Engineering, Business Analysis, Communication skills, Data Science, Troubleshooting skills, Graphics Designing.

There are 17 roles in this dataset: AI ML Specialist, API Integration Specialist, Application Support Engineer, Business Analyst, Customer Service Executive, Cyber Security Specialist, Data Scientist, Database Administrator,

Graphics Designer, Hardware Engineer, Helpdesk Engineer, Information Security Specialist, Networking Engineer, Project Manager, Software Developer, Software Tester, Technical Writer.

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