



APNA_HUNAR (AI & ML CAREER GUIDANCE TOOL)

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Abstract—A Career Guidance System for Science students studying in 10th and 12th and after 12th standard and as well for the un - graduate people. It will help these students select a suitable career post 12th or before 12th class, which will fit along with their Aptitude, Emotional Quotient and Personality and Traits alongside their interests. This project consists of two main parts: one is the Web Portal which is an interface between the student and the system and which is designed using HTML, CSS, Javascript at the Front End, and MySQL and Python at the Back End; the other is the Recommendation Engine which has been built using Machine Learning and implemented using Python, so as to recommend suitable career options to the student using the system. There are 3 Machine Learning Algorithms which will be used: Naive Bayes, KNearest Neighbor and Random Forest Classifier. The student, on coming to the portal, will be asked to undergo a series of questions, each to test the student's IQ, EQ and Personality. Upon collecting this data entered by the student, this data will be tested against an existing dataset and suitable career choices will be recommended to the student. The Career Guidance System, when employed, will help provide proper guidance to the students regarding which career choices would be best suited to them as per their inner qualities and their interest, thus helping them pursue a proper career and achieve success in the same.

Keywords—personalized recommendation, web deployment, machine learning, template, Scriber, IEEE, format.

I. INTRODUCTION

In today's day and age, there are unprecedented developments taking place in all spheres of life, ranging from art to technology, and everything in between. More and more fields are coming up, more and more technologies are being discovered, more and more advancements are taking place in the existing technologies. An increase in technologies, in turn, leads to an increase in the demand of professionals who, in their careers, could effectively work with those technologies. And for these professionals to be successful in their respective fields, it is imperative that they make conscious and wise decisions while selecting their careers.

This article discus how such concerns can be addressed and designed and developed a Career Guide Student Information System (CGSIS), that will completely remove the problem of lack of speedy and ready access to information of subject combinations that can lead to various career choices, job opportunities for such careers and associated benefits.; making the students to be the architect of their careers. This Is a Level 2 Heading Students pursuing Science almost always face a dilemma as to which field should they study in after completing 12th. This is due to the plethora of career options available to them coupled with them having little to no knowledge about those careers, their future scope, as well as a misalignment between their interests, knowledge, and strengths and skills. number it in parentheses, and use this number to refer to it in the text (1).

(1) $a+b=y$

This article will defiantly help such a kind of UN- graduate people like didn't clear the class 10th standard but still wants to develop in the carrier so in that case our project will definitely help it will recommend for the vocational training courses means in which not be required much more quality of the previous background.

Just it will have recommended for the training which will be able to stand out to start our own business or can join the jobs (private or government).

In this article we have taken some input parameters and then on the behalf of all these parameters we can recommend suitable solution.

i. Web Portal

The Career Guidance System is a Recommendation System, the output of which is given on a web portal. The technical aspects of this project are HTML, CSS, BOOTSTRAP, PHP, SQL, FLASK, Python.

In this project, we build a Web Portal. The student arrivesat the Web Portal, wherein he/she will have to attempt MCQ based questionnaires each testing his/her IQ i.e. the Aptitude, his/her EQ and his/her Personality traits. The portal will also collect information about the interest of the user. The MCQs in the IQ questionnaire will have only one correct option, whereas MCQs in the EQ and Personality questionnaires will not have

any single correct option as they are subject to the person's traits and differ from one person to the other. After submitting all Questionnaires, the answers will be stored in a database, from where they will be used as the test case against an existing dataset so as to recommend career choices to the student. On the Machine Learning front, firstly we have collected data for our dataset by circulating questions, gathered from professionals, amongst people from different branches, streams and careers. We then built a Recommendation Engine after trying and testing our Machine Learning model with different algorithms, and selected the algorithm which provides best accuracy and results. To compensate for the less amount of data collected, we will be combining 2 methods to get the desired optimum result. We shall test our sample data entry from the student against our training dataset, and display the top career choices on the Web Portal. We have used the following to build the portal: HTML (Hypertext Mark-up Language) part to structure a web page and its content. CSS stands for Cascading Style Sheets. It describes how HTML elements should be displayed.

ii. Registration Page

HTML and CSS is used for the creation of the login and registration page, Login and registration page is just a quick taking information for the feature records data, it's only for one-time data collection system and once when you have register then can't give similar data same again.

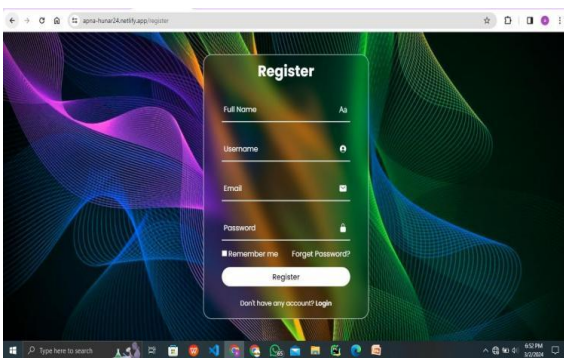


Fig 1: Registration page

iii. Home page

On screen. React is a front-end framework used to create our web portal. Flask framework is deployed on a web server and is used to have links between the data set and the web portal to get the answers from the student coming to our portal. XAMPP to treat a local host like a remote host by connecting using an FTP client.

Using the above said technologies, we have made a web portal. Under we have attached a picture which gives you all an idea about how it would look.



Fig 1: Home Page

It will be an introduction page which gives the user an idea about the portal and it works and a gist about us. It consists of a nav-bar, about us para and a footer.

iv. Course offered

Basically we have categories in three parts of the problems as we have mentioned in the pictures vocational, non- engineering and engineering in this three parts we have covered all problem conclude in this.

For each and every types of people can get help via using this application



Fig 2 : skill you got

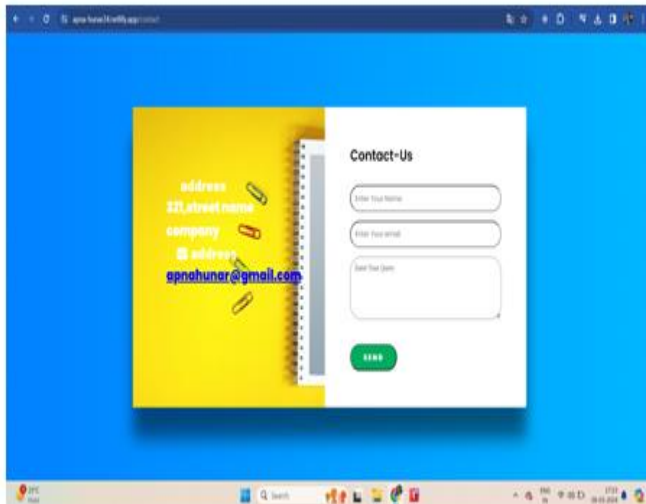
V. Result page



Fig 3 : Result page

vi. Contact page

The next page will be the contact us page. It consists of a navbar, contact-us form, details about the institute and a footer. The page consists of a contact us form for any technical issues and also a number and email of a carrier consulting institute. Underneath we have attached a picture which gives you all an idea about how it would look.



II. MACHINE LEARNING

Machine learning is at the core of the project. It is being extensively used to help predict and recommend suitable career choices to the user at the portal. Our project is basically a recommendation system and various machine learning algorithms can be used to build recommendation systems depending on the output requirement.

Recommendation systems work on recommendation engines. A recommendation engine filters the data using different algorithms and recommends the most relevant items to users. It captures the liking and inclination of the user and based on that recommends options which match the user's inclination.

Recommendation engines work on filtering models. There are 2 main types of filtering models: Content Based Filtering and Collaborative Filtering. Content based filtering works when the previous preferences and likes and dislikes are known so as to filter what product could be liked in the future.

In the case of the Career Guidance System, this doesn't work. Thus, we turn towards Collaborative Filtering.

Collaborative Filtering further is of two types: User-User Based Filtering and Item-Item Based Filtering.

User Collaborative Filtering first finds the similarity score between users. Based on this similarity score, it then picks out the most similar users and recommends products which these similar users have liked or bought previously. Item-Item Collaborative Filtering finds similarity between each pair of items, and then recommends items liked in the past.

While the data was being collected, we tested various machine

learning algorithms on Movie Recommendation Dataset. Support Vector Machine (SVM) gave an accuracy of 0.68, while Naive Bayes algorithm gave an accuracy of 0.75. We have decided to use Naive Bayes, K-Nearest Neighbour and Random Forest Classification Algorithms. For collecting the dataset, we needed to decide which models to use for gauging the personality of the person, for which we researched the following models.

Holland Codes: Holland Codes are one of the most popular models used for career tests today. Holland argued that the choice of a vocation is an expression of personality. There are six personality types in Holland's model and most people will fit into a few of the categories:

The Big Five: The Big Five come from the statistical study of responses to personality items. Using a technique called factor analysis researchers can look at the responses of people to hundreds of personality items and ask the question "what is the best way to summarize an individual?".

MBTI: The underlying assumption of the MBTI is that we all have specific preferences in the way we construe our experiences, and these preferences underlie our interests, needs, values, and motivation. The MBTI sorts psychological differences of people into four opposite pairs, or "dichotomies", with a resulting 16 possible psychological types.

We needed to implement the Personality Test in our google form so as to gather data. In Big 5 Personality Test, the personality of the person is calculated using a set of 5 mathematical formulae which is much more easy to implement using excel sheets as compared to Holland Code and MBTI. Thus we selected the Big 5 Personality Test, for both testing the user as well as for collecting our data.

III. RESULT

The student arriving at our portal will first select the options of their interest and then will go for the questionnaires presented on their screen. The answers that they have selected will be then directed to the database of our system which will become our testing data. We needed to implement the Personality Test in our google form so as to gather data. In Big 5 Personality Test, the personality of the person is calculated using a set of 5 mathematical formulae which is much more easy to implement using excel sheets as compared to Holland Code and MBTI. The machine learning requires the data for testing and training. The answers selected by students will be used for the training part of machine learning. Thus after the model trains on our training data and our input from the user is taken as test data from which we get the recommended career as our output. The accuracy through the various algorithms differs from each other.



IV. CONCLUSIONS

A portal has been designed for taking inputs from the applicant, testing his/her aptitude as well as his/her interests and personality. These inputs are used as the test data for the Machine Learning model which then gives the recommended career as the output. It is also observed that the accuracy predicted of various methods differ from each other. It is predicted that the Random Forest Classifier will be providing highest accuracy and the Naive Bayes Algorithm will be providing least accuracy.

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ML ALGORITHM	ACCURACY
Linear Regression	0.81
K-Nearest Neighbour	0.83
Random Forest Classifier	0.87

Table 1: Machine Learning Algorithm performance

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