

PROFESSION GUIDANCE THROUGH MACHINE LEARNING

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Abstract: *In the current era getting a job is not that simple. Under the pressure of the rising competition the students tend to learn too many skills and get confused as to which skill can be more helpful to them in helping them get the job. They have no one to go to for the proper prediction of the job. This designed system takes the input from the user about the skills and preferences and will predict the job opportunity that is best for them. The student will be able to see the possibility of getting the job in a particular sector and then plan accordingly his actions to reach the desired job. In the current era we see that many students have done too many skills and also, they have activities during their college time but they are so confused about choosing the best career option according to their skill and activities. This system helps students to get their dream job.*

Keywords: *Machine Learning, Decision Tree*

I. INTRODUCTION

Nowadays the students possess different skills and different interests. These students usually feel confused while choosing the career best for them. This project is intended to analyze their skills and give them the result as the sector which is best based on their skills and interests.

Various sectors that can be chosen:

- Private
- Public

What is a private sector?

Private sector is a part of the economy which is meant to be run by individuals or a group of persons for profit. These sectors aren't operated by the government. Some companies and corporations which are government run are part of the public sector while part of the voluntary sector are charities and other non profit organizations.

- Large share of the economy tends to be made up by the private sector in free market, capitalist based societies.
- Private sector have all privately owned profit making business in the economic

Private Job:

Most of the companies recruit graduates and check their aptitude, technical skills, attitude & ability to perform t Since the private sector is completely different for the public in every other way, the difference also lies in the selection procedure for the private sector jobs.

What is the government sector?

The government sector consists of the following resident institutional units: all units of central, state or local government; all social security funds at each level of

government; all non-market non-profit institutions that are controlled and financed by government units.

Government Job:

Those applying for a Government have to keep in mind a lot of things. Usually, application forms for Government jobs have a fixed date of release, and also these come with a specific time period for a candidate to apply. Generally, it's a bit tough to get a Government job, as there are many candidates applying for a particular opening, and usually these jobs are open at all India levels, and candidates from all over the country apply, thereby making the competition tough. Hence there is a need for good preparation of those exams.

The main benefit of the Government job can be attributed to the job security.

Various websites that perform career path prediction:

using the unique opportunity to develop your own quiz and publish it on all the tests.com. And you will be the one to decide about the form and the content without need of any programming skill.

<https://www.thebalancecareers.com>

Here you start by answering questions on the Discover Page (which is powered by the Career Genome Project) to learn what makes you unique and to get suggestions for what could be your perfect career.

You will get a short list of the top careers to consider after completing the questionnaire. Then you're prompted to continue answering questions for a more complete evaluation.

The quiz is quick and simple to complete. It takes 20 - 30 minutes and you can finish it at your own pace. Respond to each question by clicking on the answer which describes you the best. You won't have to think too hard about your responses. In fact, one of the choices for some questions is to say that you're not interested.

Factors (skills) that will choose the career:

Some of the skills that will be essential for making the decision for suitable profession are like

1. Communication

Communication skills are basically a way of transferring information from one person to another people. No matter the job or field, communication is required both inside and outside an organization. The ability to communicate effectively is one of the most essential skills for the workforce. n. Parents see the value, too! According to the NBC News State of Parenting Poll, sponsored by Pearson, 54% of parents said good social and communication skills are most important for their child's future success (more

important than grades). Pew research found the same; communication skills were the most important skills

2. Collaboration and Teamwork

Many of the job requirements are sort of collaboration and teamwork among employees. Every age group employee must have the ability to work in a team plan or structure. When young people take entry in the team, they have to learn to think beyond their thoughts and their desires, toward the common goal of their company or organization.

3. Initiative and Self-Management

Every employee wants her worker to have leadership qualities. but this doesn't mean that the younger will can be a leader for the project or boss in the department. It means they possess all skills that show leadership potential. This means they have initiative and are looking further for other possibilities.

4. Technical skills

Technical skills are abilities needed to do specific tasks that require specialized knowledge. They are most common in IT, mechanics, engineering, science, finance, mathematics, etc. Technical skills are often required to operate machinery, tools, software, and coding. They're usually very practical and demand in-depth training.

5. Soft skills

They comprise common sense, interpersonal skills, emotional intelligence, character traits as well as communication skills among others. Soft skills are a term referring to a set of transferable skills that are highly appreciated by employers.

6. Interpersonal skills

Interpersonal skills include a set of interrelated abilities such as active listening, conflict resolution or effective communication, among others. Interpersonal skills are the skills that allow you to interact with other people. In terms of business, they're often referred to as an ability to get along with people.

II. LITERATURE SURVEY

The resume analysis and prediction can be done in various ways. Psychometric analysis is used to gather the information about a person using an assessment, and the conclusion is then drawn from the results obtained. So, the measurement of the behavioural patterns is used for the greater assessment process. In [1] the information was collected by the researchers to establish Psychometric assessment.

Psychometric assessment is considered as a tool for successful analysis. This process brings objectivity to an otherwise subjective approach, in [2] study is made to investigate the use of the psychometric assessment process which aimed at analysing the use of accreditation in the assessment process. The research in [1] was done based on general psychometric analysis which [2] gave importance to special assessment and decision making procedures. In [3] authors talked about the effect of assessment and company skill needs based on the assessment. Various tools can be

used for the work related situational analysis but only few are

reliable. Examination of the factor structure of the HSE(Health and Safety Executive) MS (Management Standard) Indicator Tool using organizational-level data has been done in [4]. The authors of [5] used physical questionnaires for the assessment but the research changes the process of psychometric analysis by using a website. Then different assessments could be done by different steps for long physical assessments.

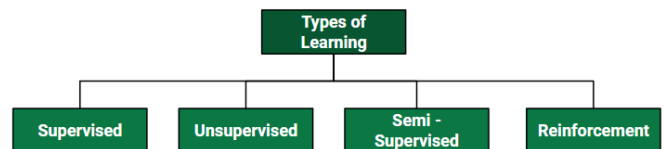
The authors of [6] used participle, regular expression technology, mutual information based cosine vector angle text sort technology and regular expression matching. The texts were divided as structured, semi structured and free texts. Resume was considered as a semi structured document Semi structured document extraction process is used for analysis. They mainly adopted three kinds of algorithms: content matching, analysis based on the statistics and conjunction of context, [7].

How we will choose the suitable profession:

In order to done predicting suitable profession we will be used following technologies:

Machine Learning:

Machine learning is used in models for prediction. Prediction is done using machine learning which uses a python library. Automatic memory management through garbage collector and dynamic typing is supported. Names of functions and variables are bound at time of execution in python..



In this our project to build model we will be used Supervised Learning:

Supervised Learning:

Supervised learning is when the model is getting trained on a labeled dataset. Labeled dataset is one which has both input and output parameters. In this type of learning both training and validation datasets are labeled as shown in the figures.

In this project to train the model we will be used following techniques:

Regression:

It is a Supervised Learning method for continuous value. The aim of the model is to predict the values according to the actual output values followed by the evaluation of the error values. The goal is to minimise the error [3].

Machine learned ranking(MLR):

Machine-learned ranking a machine learning application used in the modelling of ranking models for retrieval of information. Items in the list of training data are arranged in an order. In this a numerical score is given to establish the

order of the list items. The purpose of the ranking model is to rank, i.e. production of an arrangement of items in novel lists in a way which is according to rankings of the training data [4].

Proposed work:

In this project we will create a model which is able to suggest the suitable profession on the basis of input received from the user. This model takes students skills as input and analysis based on input and dataset. After doing analysis this model will return prediction as output.

The main objective of this project is to build a model which is able to predict the suitable profession according to the user's educational performance.

Our objective is also to deploy our project on live server (cloud) by which any user can access this service from anywhere.

To fulfill the objective, we are doing following things:

- To build a prediction model we are using the "Machine Learning (ML) algorithm on a dataset".
- To process new data in a dataset we are using "Unsupervised Machine Learning".
- To provide user access we are creating a UI by using "Django, Bootstrap".

Job/Higher Studies?	Type of company want to settle in?	Senior or elders in games	Interested in books	Expected Type of Books	Salary Range	In a Reactions	Gentle or Stubborn?	Management or Technical work?	Salary/Smart work?	Hard/Soft in teams?	Worked in Internship?	Suggested job Role
higher studies	Web Services	no	no	Prayer books	salary	no	stubborn	Management salary	hard work	yes	no	Suggested job Role
job	SaaS services	yes	yes	Childrens	salary	yes	gentle	Technical salary	hard work	no	yes	Suggested job Role
higher studies	Sales and Marketing	yes	yes	Travel	Work	no	stubborn	Management work	hard work	no	yes	Suggested job Role
higher studies	Testing and Maintenance	no	no	Romance	Work	yes	gentle	Management work	smart work	yes	yes	Suggested job Role
higher studies	product development	no	yes	Cookbooks	salary	no	stubborn	Management work	hard work	yes	yes	Suggested job Role
job	Testing and Maintenance	yes	yes	Self help	salary	no	stubborn	Management work	smart work	yes	no	Suggested job Role
job	BPA	no	no	Drama	Work	yes	gentle	Technical salary	hard work	yes	yes	Suggested job Role
higher studies	BPA	no	no	Romance	salary	no	stubborn	Technical salary	smart work	no	no	Suggested job Role
job	product development	no	no	Math	Work	no	gentle	Technical work	hard work	yes	yes	Suggested job Role
higher studies	Sales and Marketing	no	yes	Religion-Spirituality	Work	yes	gentle	Management salary	hard work	yes	no	Suggested job Role
higher studies	Testing and Maintenance	yes	no	Cookbooks	Work	yes	stubborn	Management salary	hard work	yes	yes	Suggested job Role
higher studies	Service Based	yes	no	Anthology	Work	yes	stubborn	Management work	smart work	yes	no	Suggested job Role
higher studies	Testing and Maintenance	no	yes	Trilogy	salary	yes	stubborn	Technical work	smart work	yes	no	Suggested job Role
job	Testing and Maintenance	no	yes	Autobiographies	salary	yes	stubborn	Management work	smart work	yes	yes	Suggested job Role
job	Testing and Maintenance	yes	no	Math	salary	no	stubborn	Management work	hard work	yes	no	Suggested job Role
higher studies	Testing and Maintenance	no	no	Childrens	salary	no	stubborn	Technical salary	hard work	no	no	Suggested job Role
job	Sales and Marketing	yes	yes	Mystery	salary	yes	gentle	Technical work	hard work	yes	yes	Suggested job Role

Fig 1.3: Sample of Dataset

The motivation behind this system is to develop an application that will help students to predict their suitable profession. This is a far different approach than employment websites. Our system allows the candidates to enter information about academics, skill set etc. . The entered information is then extracted and after that analyzed by our system. This makes our search process easy.

Following are the steps which helps to create this project:

- Our first step to train our machine learning model. During the training of the model the first step is to take a dataset and divide it into two sub logical dataset called Training Dataset and Testing Dataset. After dividing the dataset first we take the Training Dataset and fit it into the Training Algorithm. After fitting we will get Trained Model.
- Now we will perform testing on the Trained Model by taking features of Testing Dataset. This will give a Predicted Label. After this we calculate error by comparing Predicted Label and Label of Testing Dataset. If error is minimum then we will choose this model as a final model otherwise we will

perform training again and again until we will get minimum error using different training algorithms.

- After getting the final model we will provide information entered by the user to this model. And finally, this model provides a suitable profession to use according to their entered information.

Expected outcome

By this paper we propose to take the input from the user and on the basis of those inputs predict the job sector in which the user is the most to be placed based on the skills that he possesses. The outcome to this project is

1.The information in the database formed by the responses of the user will be used to predict the domain and the sector in which the user is best t to join based on the skills and the activities that has been performed by the user on the academic grounds that help in the placement.

Fig: Flow Chart for System

III. CONCLUSION

Students today are confused and sometimes directionless as to which job can be get based on the skills or which will be the best job opportunity that he can possess based on the skills. By this paper we aim to help the students or anyone who is in need of a job to get an idea of what are the possible options in which he can explore and find the best job that suits the needs and the skills of the user.

For this process several procedures and algorithms can be used. The dataset procured for this type of problem was categorical and thus classification procedures were used for the prediction.

On further analysis of the various algorithms that were available we conclude that the Support Vector Machine does a fairly good job at predicting the correct alternative and class label than other algorithms namely the decision tree.

Future Enhancements:

Our project mainly works on the local server. It can be developed further for cloud hosting on the cloud platform so that users from all around the globe can access the project for their benefit.

At present the project mainly deals with the professions that are related to the computer science background. Further enhancements can be made to the working of the project so as to accommodate the provision of jobs and professions of other streams as well.

A limited spectrum of the algorithms available are being employed by us in this project. Further enhancements can be made to this so that many other algorithms can be accommodated to it and may thus increase the efficiency of the project and procedure.

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