PREDICTION OF ADMISSION & JOBS IN ENGINEERING AND TECHNOLOGY/MANAGEMENT/PHARMACY WITH RESPECT TO DEMOGRAPHIC LOCATIONS

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1. Introduction

The exponential growth in the number of students and professionals aspiring to pave their career in the field of Engineering, Technology, Management and Pharmacy has led to a very important question that cannot be left unanswered: Does our country render the proportional number of vacancies in these fields? We took upon the zeal to answer this and the conclusions were fascinating. It turned out that the availability and probability of getting a job depends greatly on the demographic locations, among other factors. In India, and around the world, we have a fair amount of population who is qualified enough in their respective areas of interest and are still jobless due to the scarcity of jobs in their domain. The problem of unemployment can be greatly reduced if there is some mechanism or channel which can direct the needs of the organizations to the right individuals, providing them with the opportunity to work on the things they are good at doing. Also, the number of admissions in a particular branch in universities can be optimized according to the needs in that particular location. The data can be collected and obtained from various agencies and after proper preprocessing, it can be fed to a neural network and the advancing deep learning algorithms can be used to make predictions with high accuracy.

Hence, we present the idea of an application software which fulfils the need stated above. The app will display jobs and vacancies in a particular area based on it's demographic location. This app will have a sign-in portal which will take the basic information about user's academic qualifications and interests. The system will run in the background to display the user with the most relevant jobs. This will serve two very basic and important purposes:

1. The needs of a particular professional in an area can be fulfilled.
2. Users can easily find the job in a particular area where he wish to work.

2. Technologies stack

Below is the potential list of technologies which we will be using.

1. Python - for backend computations
2. MongoDB - to store the registered user information
3. Android Studio/Netbeans IDE - to develop the user interface
4. tensorflow/keras - to create neural network models and perform computations
5. matplotlib/seaborn - for 2D and 3D visualization of data
6. numpy/pandas - python dependencies for scientific computations

Later, this can be converted into a web app and then the additional technologies required will include javascript, json, html, css, django.

3. Working

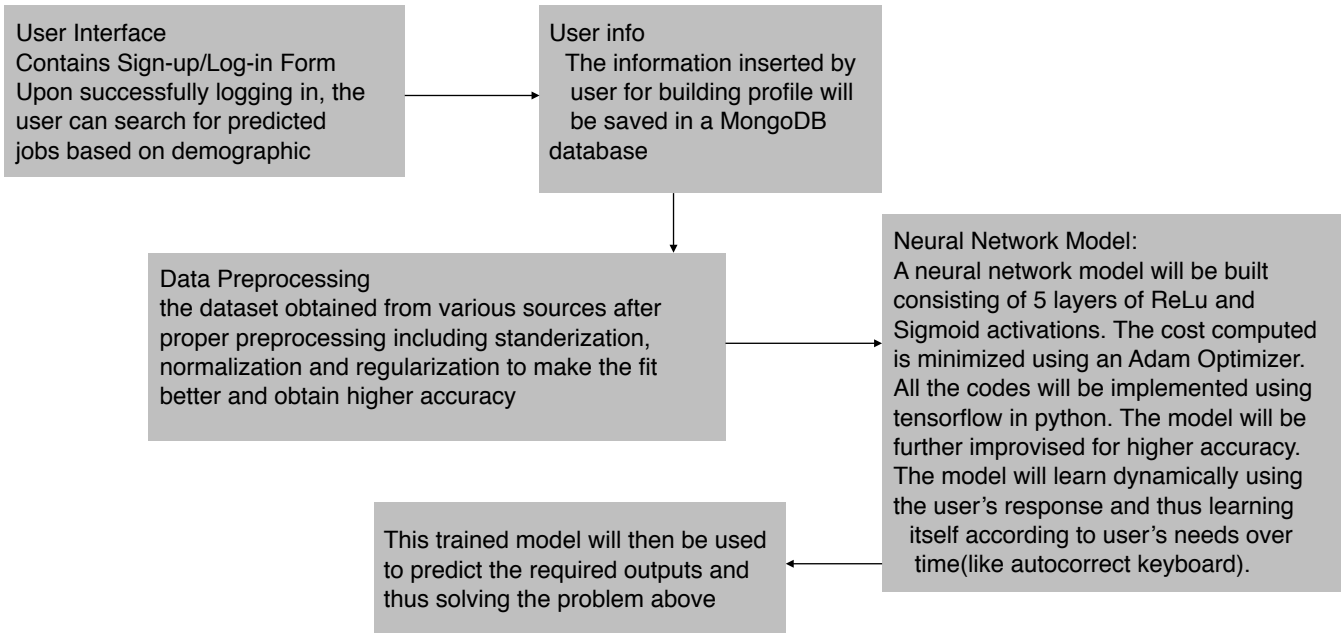
1. User Interface
The user interface will require a sign-in form to be filled before user can use the services. The application software will be built using Android Studios/ Netbeans IDE which will have Labels, Text boxes and Buttons. The labels will direct the user about what to fill in a particular text box and upon completion, the data will be saved in the database providing user with a unique user id and password. The user can also use their gmail id for creating their profile and use those sign-in details.

2. Saving the data
The data collected using the sign-in form will be saved in a MongoDB database for future reference and use. This data will be fed in the deep learning model to predict the list of relevant jobs.

3. Neural Network Model
The neural network model will be built using tensorflow and keras and the codes will be written in python 3.6.1. The model will be trained on the dataset obtained from various sources after proper preprocessing including standerization, normalization and regularization to make the fit better and obtain higher accuracy. The model will be then used to predict the relevant jobs for the user based on the data provided. It will also capture the result if an user apply for a particular job suggested by the system and thus improving the learning algorithm over time.

4. The dataset(training and testing)
Initially, we will be using the data set from our college as well as from colleges in and around Chhattisgarh. The dataset will contain the basic info of an individual, his interests and the jobs he got hired in. Along with that, the dataset will also contain the name of the organization and the proportion of employees in various departments. On running the model through a neural network and minimizing the cost, we will be able to predict the job opportunities of an individual in a particular location based on his qualifications and interests. Also, it will help us to get an in-depth intuition about the need of a particular stream in an University and hence solve the major problem stated above.

4. Workflow schematic



5. Uniqueness of the idea

Our model is based on the most advanced deep learning algorithms which will provide state-of-art performance. The model also learns dynamically and hence it will provide a personalised experience to the user.

6. Conclusions

The problem stated above can be effectively solved by using the proposed idea and thus eradicating the problem of unemployment of skilled professionals. Universities can vary their intake in a particular stream based on the demands in that location and change it from keeping it stereotypically constant, which is much needed in the present scenario.