**CS5346**

**Project 1:**

**Expert Profession Recommender System**

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**Introduction**

**1.1 Problem Statement**

According to the National Center for Education Statistics, the current cost of attending a 4-year institution of higher education is currently more than $26,000 annually in the United States. With these high costs being placed of students it is imperative that we give students the tools to complete their educations as efficiently as possible and to realize the greatest result from their education after they’ve graduated.

Giving students expert guidance as early as possible in their educations will help them realize the greatest benefit from the cost of their education. But our nation collectively also invests a great amount in the education of our students on top of their contribution of tuition. We rely on students being properly placed in positions were they can excel. Properly pairing well educated students with high-demand jobs assures the greatest return to the community for the expense of educating a young adult.

The earlier a student can be given the expert guidance the better. Early guidance will allow a student to shape their education most effectively. But human guidance is often an expensive commodity. With college attendance rates steadily rising, undergraduate counselors find themselves advising larger groups of students without additional resources. It is therefore greatly advantageous to students, institutions, and society that an automated career recommender be developed.

**1.2 Solution**

Modern students have nearly continuous exposure to computer and network resources. By placing an automated recommender system at their disposal, students will be given access to to early and regular career guidance.

Any automated that is applied in this problem domain will need to be able to recommend a large variety of professions to a student based on his or her interests. Furthermore it would be beneficial if this system could recommend not only a profession but a specific area within a profession.

The focus of this project will be the implementation of a system which fits these criteria.

**Contributors:**

**2.1 Gentry Atkinson**

* Graphics and Report
* Rules Base
* Variable Lists
* Definition of Profession Conditions

**2.2 Vishal Kumar Mainka Ganeshbapu**

* Object Oriented code re-factoring
* Development of Data Structures
* Industry Research
* Definition of Area Conditions

**2.3 Outside Contributors**

This project would like to thank Dr. Moonis Ali of Texas State University for providing the example code that this project was built from.

**Analysis of the Problem**

**3.1: Domain and Goal**

* Develop Rules based on the ideas and concepts we knew.
* Develop decision tree for both forward chaining and backward chaining.
* Converting the rules which we have proposed into the rules which are used as the knowledge base for both backward and forward chaining.
* Develop a program for both backward chaining and forward chaining and make it work individually.
* Then eliminate all the poorly written code and make it an efficient code.
* Develop the code into which it can be easily reused.
* Making sure both backward chaining program and Forward chaining program work in a single run.

**3.2: Problems with existing code**

* Existing program has a lot of syntax errors.
* The program had a lot of variables declared globally.
* There were a couple of GOTO (Jump statements) which is not considered to be efficient while writing the code.
* The program had arrays declared in char datatype, which would not work efficiently for an Intelligent system.
* The program was written in a very old style programming concepts and would lead to complex problems. There was no scope of reusing the code.
* All the information such as the knowledge base and inference engine data was dumped into a single code.
* Backward chaining and forward chaining was written in two separate files which is not how the intelligent system has to work!

**3.3: Proposed Solution**

* Eliminated all the syntax error.
* Modified the program without any global variables and jump statements.
* The Jump statements are converted into separate functions and made it work appropriately.
* Converted char’s of Array into String’s of Array.
* We have changed the code by implementing the OOPS concepts (Classes) to make the code more reusable and easier for understanding purpose.
* The knowledge base and Inference engine where separated into separate functions which helped us in reusing the code easily.
* Constants are used in the program to set the sizes of the array.
* Eliminated redundancy.
* Made both Backward chaining and Forward chaining program run in a single instance.