CS 514: Applied Artificial Intelligence

Project 2

Application Name: Business Portfolio Review System

Pseudo Name: MegaMind

i.   Abstract

The Business Portfolio Review System is a rule-based system using Fuzzy JESS. The system is designed to help its users determine if their current financial profile, aka business portfolio, is strong enough to help them establish their own private business. The system performs a brief analysis of the current situation of the user by asking a few questions, generates a portfolio and then examines the various factors of the user's portfolio to determine whether he/she is financially sound to start a business venture. The system also highlights some of the reasons behind its final decision/prediction and may provide some suggestions to the user in order to overcome his/her shortcomings.

ii.   Features

The user of the system will provide the following input to the portfolio generator and review system:
- User name – You may enter any name of your choice, there is no restriction on this field.
- Age – Asks the user to enter the age. It must be an integer value.
- SSN? – Asks the user if he/she has an SSN. Valid options are Yes/No (case sensitive).
- No. of credit cards – Enter number of credit cards. Must be an integer value.
- Credit score – Asks the user to enter his/her credit rating. Must be an integer between 350 to 850.
- Current stock investments value – Must be a value between 0 to 200000.
- No. of properties owned – Must be a value between 0 to 10.
- Estimated property value – Must be a value between 0 to 1000000.
- Bank balance – Must be a value between 0 to 250000.
- Amount of money owed in loans – Must be a value between 0 to 200000.

iii.   Rules and Description

The system has a total of 31 different rules. These are as follows:
- The system consists of 6 Fuzzy variables which contribute to 18 fuzzy rules in the system.
    - Credit score – Poor, Fair, Good
    - Stock investments – Low, Medium, High
    - No. of properties – Low, Moderate, High

- o Estimated property value – Low, Moderate, High
- o Bank Balance – Low, Moderate, High
- o Loan owed – Less, Moderate, High
- Apart from these 18 fuzzy rules, there are 13 boolean rules in the system that perform some of the following:
  - o Accepting user input
  - o Printing facts
  - o Age validation
  - o SSN check
  - o No. of credit cards check
  - o Final decision predicting

iv. Usage Manual

Steps to execute the .clp file:

1. Create a new java project in eclipse
2. Create a new clp file
3. Copy the contents of "Business_Portfolio.clp" into the newly created file.
4. Include the "fuzzyJ-2.0.jar" in the library.
5. In the edit configuration change the jess main class to "nrc.fuzzy.jess.FuzzyMain".
6. Run the file.

Using the application:

You'll be asked a set of 10 questions. Each question has a prompt that assists you in answering the questions correctly. Some basic personal questions don't have prompts which indicates that there is no specific right or wrong answer for those fields. Once you are done answering the 10 questions, the system would generate the estimations that it has done.

**Note that the system works on only valid inputs. It checks for validity and might fail to produce a list of players or it may throw some errors in case of invalid inputs.

v. Output Samples

Sample-1

*******************BUSINESS PORTFOLIO RATING SYSTEM****************
Enter all your details to generate your portfolio and to review it

Enter your name: Jonathan
Enter age: 24
Do you have an SSN(Yes/No): Yes
How many credit cards do you own: 5
What is your credit score (Enter value between 350-850): 700
Enter the amount of your stock investments in dollars(0-200000): 120000

Enter the number of properties that you own (0-10): 3
What is the estimated value of your overall properties in dollars(0-1000000): 300000
What is your bank balance in dollars(0-250000): 100000
What amount do you owe in loans in dollars(0-200000): 20000

*************Portfolio Evaluation Completed*********

Considering all the factors such as credit score, bank balance, stock investments, loan owed, etc. you have a satisfactory portfolio for starting a private business.
_____

Review of your portfolio along with the reasons that helped us estimate your chances:
_____

Hello Jonathan !!!

You have a moderate bank balance. This may or may not affect your profile though.
Your estimated property value is somewhat moderate which is a positive indicator.
Medium stock investments of yours would be helpful to your cause.
You are over 18 years of age which makes you eligible.
You have some credit cards issued under your name. Please make sure to make timely payments in order to keep your credit score within check as it might inturn affect your candidacy.
_____

Sample-2

********************BUSINESS PORTFOLIO RATING SYSTEM****************
Enter all your details to generate your portfolio and to review it

Enter your name: Jordan
Enter age: 18
Do you have an SSN(Yes/No): Yes
How many credit cards do you own: 2
What is your credit score (Enter value between 350-850): 450
Enter the amount of your stock investments in dollars(0-200000): 10000
Enter the number of properties that you own (0-10): 1
What is the estimated value of your overall properties in dollars(0-1000000): 50000
What is your bank balance in dollars(0-250000): 24500
What amount do you owe in loans in dollars(0-200000): 52679

*************Portfolio Evaluation Completed*********

Considering all the factors such as credit score, bank balance, stock investments, loan owed, etc. you might face issues while starting a private business. The candidacy might be improved if you look into the summary/review of your portfolio for potential shortcomings.

_____

Review of your portfolio along with the reasons that helped us estimate your chances:
_____

Hello Jordan !!!

You have a low bank balance which is a hindrance while starting a private business
Your estimated property value is somewhat low which is a bad indicator.
You own a low number of properties which might be problematic.
You have lower stock investments which hampers your portfolio.
Customer has a poor credit score which is a hindrance while starting a private business
You owe low amount in loans. This wont affect your profile but you must try to clear any loans under your name to boost your chances.
You are over 18 years of age which makes you eligible.
You have some credit cards issued under your name. Please make sure to make timely payments in order to keep your credit score within check as it might inturn affect your candidacy.

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