Applied Artificial Intelligence

Project 4

Decision Tree for Car Insurance

By Yoda

Description:

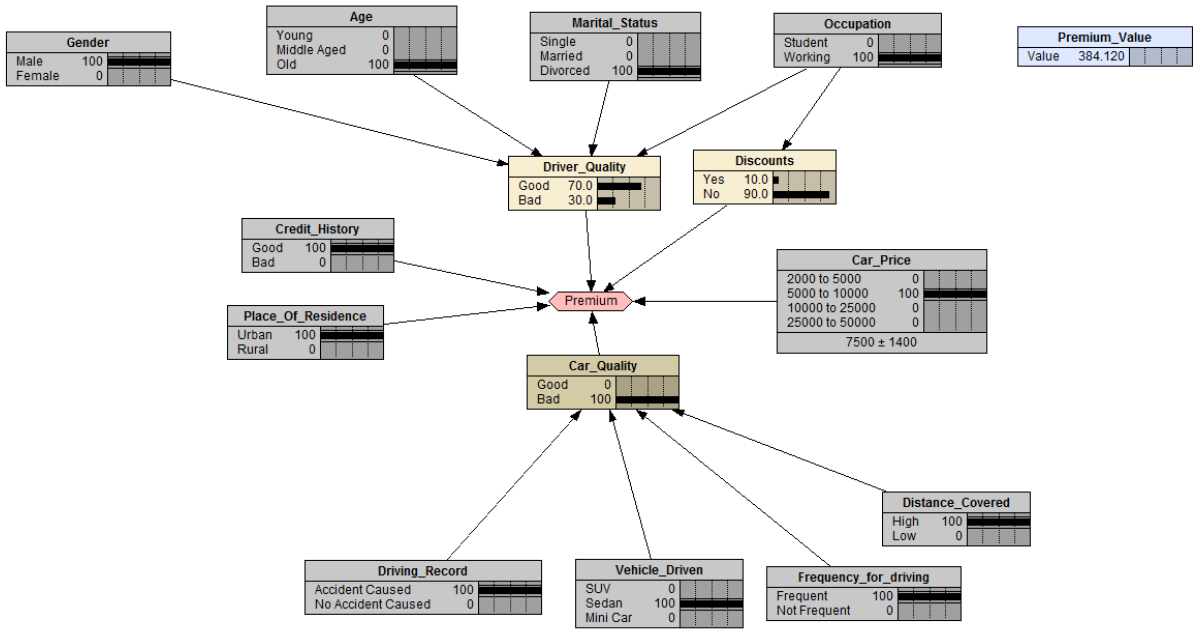

Fig 1: NETICA Diagram

This network describes the factors involved in deciding the premium for car insurance. The purpose of this project is to show how accumulation of factors can influence what the end premium value will be.

The factors which affect the premium utility node are as follows:

1. **Car_Price:**
   This represents the price ranges of the car for which the premium needs to be calculated. The different ranges are as follows:
   - 2000-5000
   - 5000-10000
   - 10000-25000
   - 25000-50000

   The higher the price of the car, the larger the premium value is.

2. **Car_Quality:**
   This represents the quality of the car driven. It's based on the following factors:
   - **Distance_Covered:**
     This is whether the car has covered long distances or not. (High, Low)
   - **Driving_Record:**
     This represents whether any accident has been caused in the past or not. (Accident_caused, No_Accident_caused)
   - **Vehicle_Driven:**
     This shows which car the person is driving(SUV, Sedan, Mini Car)
   - **Frequency_for_driving:**
     How frequently does the driver use the car(Frequent, Not_frequent)

3. **Driver_Quality:**
   This represents the quality of the driver of the car. It's based on the following factors:
   - **Gender**:
     If it is male or a female driver.
   - **Age**:
     The age group of the driver. (Young, Middle Aged, Old)
   - **Marital_Status:**
     Whether the driver is single, married or divorced.
   - **Occupation**:
     What the occupation of the driver is. (Student, Working)

4. **Credit_History:**
   A good or bad credit history can have a huge impact on the car insurance premium value.

5. **Place_of_Residence:**
   Where the driver uses his car influences the premium value. Driving in the urban areas tends to larger premium value and lesser in rural areas.

6. **Discounts:**
   Students receive discounts when they look for car insurance. Working crowd does not receive much benefit.

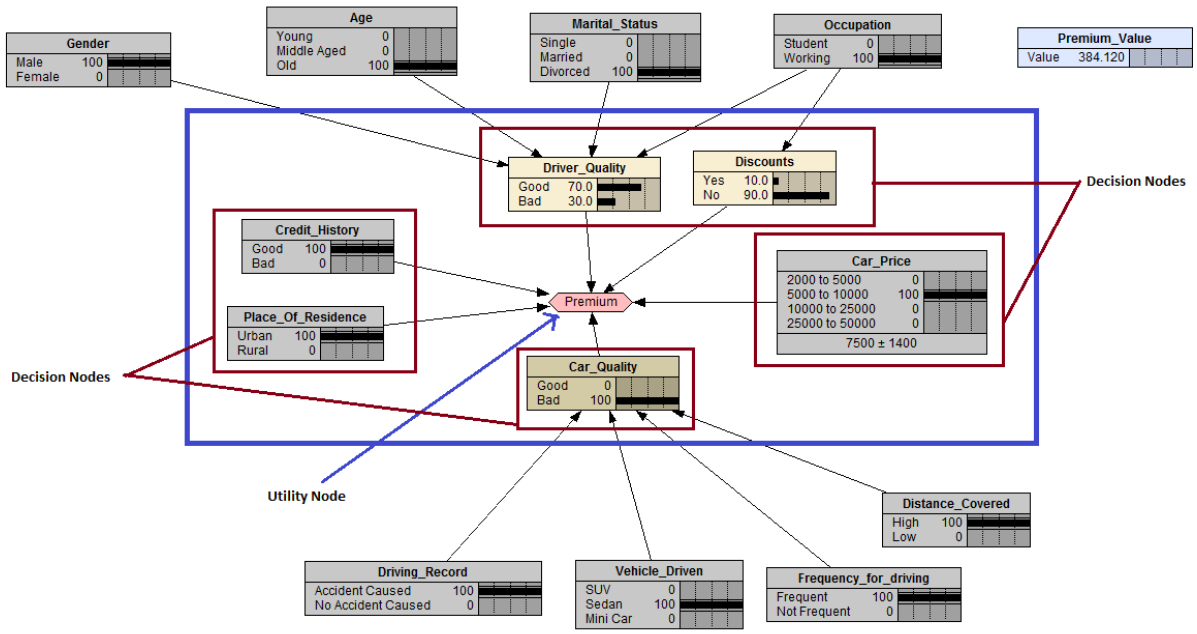

Fig 2: Network with Utility and Decision Nodes

Diagram Explanation:

1. Blue arrow points to the Utility Node which is the final premium value whose value is based on certain factors.
2. Red arrows point to the decision nodes in the network. Based on the values of these decision nodes, the value of the Utility node will be calculated and displayed on the top right corner.

Test Cases:

(See how Premium_Value changes everytime)

1. Change the values of gender, age, marital_status, occupation.
2. Change the values of drving_record, vehicle_driven, frequency_for_driving and distance_covered.
3. Change the car_price range.
4. Change the credit_history value.
5. Change the place_of_residence value.