

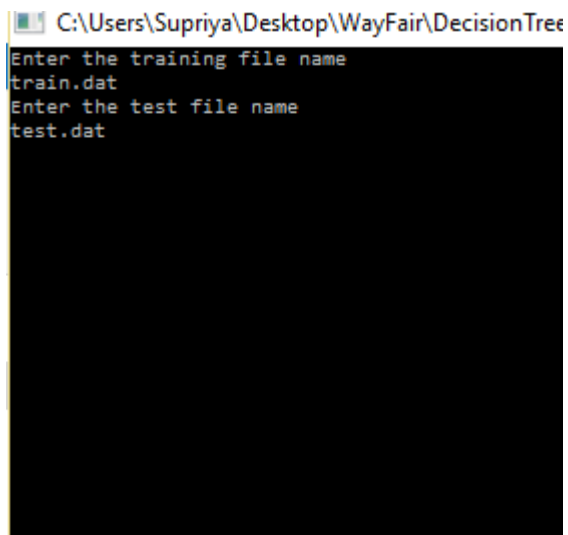
Decision Tree:

Code Description:

- 1) The `DecisionID3.cs`(`WayFair\DecisionTree\SourceCode\DecisionTree\CodeFiles\DecisionID3.cs`) class file has the main logic for construction of the decision tree.
- 2) The `Program.cs`(`WayFair\DecisionTree\SourceCode\DecisionTree\CodeFiles\Program.cs`) class file is the driver program that has the main method and has the logic to process the input file , traverse the decision tree and perform predictions on the test data and calculate the accuracy.
- 3) The `Attribute.cs`(`WayFair\DecisionTree\SourceCode\DecisionTree\CodeFiles\Attribute.cs`) class file and `TreeNode.cs`(`WayFair\DecisionTree\SourceCode\DecisionTree\CodeFiles\TreeNode.cs`) are helper classes used to for attributes and nodes respectively.

To run the code below are the instructions:

- 1) Run the executable at `WayFair\DecisionTree\SourceCode\ID3_Executable.exe`
- 2) **Input:** The program will prompt to enter the training file name and then the test file name on the command prompt once started. (*train.dat* can be entered for train file and *test.dat* for test file, these files are already included in the project)



```
C:\Users\Supriya\Desktop\WayFair\DecisionTree
Enter the training file name
train.dat
Enter the test file name
test.dat
```

- 3) **Output:** The program will output the decision tree constructed using the *train.dat* dataset and also the accuracy achieved in terms of % on both the test and train dataset.

Enter the test file name
test.dat
Decision Tree
attr5=0:

```
attr6=0:
  attr2=0:
    attr1=0:
      attr4=0:
        attr3=0:0
        attr3=1:0
      attr4=1:
        attr3=0:0
        attr3=1:0
    attr1=1:
      attr4=0:
        attr3=0:0
        attr3=1:0
      attr4=1:0
  attr2=1:
    attr4=0:
      attr3=0:0
      attr3=1:
        attr1=0:0
        attr1=1:0
    attr4=1:
      attr1=0:
        attr3=0:0
        attr3=1:0
      attr1=1:
        attr3=0:0
        attr3=1:0
  attr6=1:
    attr4=0:
      attr2=0:
        attr3=0:
          attr1=0:0
          attr1=1:0
        attr3=1:0
      attr2=1:
        attr1=0:
          attr3=0:0
          attr3=1:0
        attr1=1:
          attr3=0:0
          attr3=1:0
    attr4=1:
      attr2=0:
        attr1=0:
          attr3=0:0
          attr3=1:0
        attr1=1:
          attr3=0:0
          attr3=1:0
      attr2=1:
        attr1=0:
          attr3=0:1
          attr3=1:1
```



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```
File:///C:/Users/Supriya/Desktop/vwayfair/DecisionTree/SourceCode/DecisionTree/CoderFiles/bin/Debug/ConsoleApplication1.exe
|attr1=1:0
|attr3=1:0
|attr2=1:
|attr1=0:0
|attr1=1:0
|attr4=1:
|attr1=0:
|attr2=0:
|attr3=0:0
|attr3=1:1
|attr2=1:
|attr3=0:1
|attr3=1:0
|attr1=1:
|attr2=0:
|attr3=0:0
|attr3=1:0
|attr2=1:
|attr3=0:0
|attr3=1:0
Accuracy on Training File (800 instances) is 89.38%.
Accuracy on Testing File (203 instances) is 87.19%.
```

- 4)The program is written in C#. (Hence for compiling visual studio(2012 preferable) is needed).
- 5)To compile the program
 - a)Open WayFair\DecisionTree\SourceCode\DecisionTree\CodeFiles\MachineLearningID3.csproj
 - b)Click on 'start' button in the horizontal panel and the program shall compile and run.
- 5)The code has 4 source files like attribute.cs,Program.cs,TreeNode.cs and DecisionID3.cs.
- 6)If code has to be tested on other train and test files the files need to be placed at.
WayFair\DecisionTree\SourceCode