

Program1 : Implement and demonstrate the FIND-S algorithm for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a .CSV file.

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In [52]: import random
import csv

attributes = [['Sunny', 'Rainy'],
              ['Warm', 'Cold'],
              ['Normal', 'High'],
              ['Strong', 'Weak'],
              ['Warm', 'Cool'],
              ['Same', 'Change']]

num_attributes = len(attributes)

print (" \n The most general hypothesis : ['?', '?', '?', '?', '?', '?']\n")
print (" \n The most specific hypothesis : ['0', '0', '0', '0', '0', '0']\n")

a = []
print("\n The Given Training Data Set \n")

with open('C:\\Users\\thyagaragu\\Desktop\\Data\\ws.csv', 'r') as csvFile:
    reader = csv.reader(csvFile)
    for row in reader:
        a.append (row)
```

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        print(row)

print("\n The initial value of hypothesis: ")
hypothesis = ['0'] * num_attributes
print(hypothesis)

# Comparing with First Training Example
for j in range(0,num_attributes):
    hypothesis[j] = a[0][j];

# Comparing with Remaining Training Examples of Given Data Set

print("\n Find S: Finding a Maximally Specific Hypothesis\n")

for i in range(0,len(a)):
    if a[i][num_attributes]=='Yes':
        for j in range(0,num_attributes):
            if a[i][j]!=hypothesis[j]:
                hypothesis[j]='?'
            else :
                hypothesis[j]= a[i][j]
        print(" For Training Example No :{0} the hypothesis is ".format(i),
hypothesis)

print("\n The Maximally Specific Hypothesis for a given Training Examples :\n")
print(hypothesis)

```

The most general hypothesis : ['?', '?', '?', '?', '?', '?']

The most specific hypothesis : ['0', '0', '0', '0', '0', '0']

The Given Training Data Set

['sunny', 'warm', 'normal', 'strong', 'warm', 'same', 'Yes']

```
['sunny', 'warm', 'high', 'strong', 'warm', 'same', 'Yes']  
['rainy', 'cold', 'high', 'strong', 'warm', 'change', 'No']  
['sunny', 'warm', 'high', 'strong', 'cool', 'change', 'Yes']
```

The initial value of hypothesis:
['0', '0', '0', '0', '0', '0']

Find S: Finding a Maximally Specific Hypothesis

For Training Example No :0 the hypothesis is ['sunny', 'warm', 'normal', 'strong', 'warm', 'same']

For Training Example No :1 the hypothesis is ['sunny', 'warm', '?', 'strong', 'warm', 'same']

For Training Example No :2 the hypothesis is ['sunny', 'warm', '?', 'strong', 'warm', 'same']

For Training Example No :3 the hypothesis is ['sunny', 'warm', '?', 'strong', '?', '?']

The Maximally Specific Hypothesis for a given Training Examples :

```
['sunny', 'warm', '?', 'strong', '?', '?']
```