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.

In [3]:

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# Date : July 11 2018
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")
#C:\Users\thyagaragu\Desktop\Data
with open('C:\\Users\\thyagaragu\\Desktop\\Data\\ws.csv', 'r') as csvFile:
    reader = csv.reader(csvFile)
    for row in reader:
        a.append (row)
        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', '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', '?', '?']
```