1. Using EconomyCar.csv dataset

Ishan Gupta - 19BCE7467 - Find S Algorithm

```
import random
import csv
attr = [['Japan','USA'],
              ['Toyota','Chrysler','Honda'],
              ['Green','Blue','Red','White'],
              ['1970','1990','1980'],
              ['Sports','Economy']]

num_attr = len(attr)


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

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


 The most specific hypothesis : ['Phi','Phi','Phi','Phi','Phi']
```

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

with open('/content/EconomyCar.csv', 'r') as csvFile:
    reader = csv.reader(csvFile)
    for row in reader:
        a.append (row)
        print(row)
```

```
 The Given Training Data Set

['Japan ', 'Honda', 'Blue ', '1980', 'Economy', 'Yes']
['Japan ', 'Toyota', 'Green', '1970', 'Sports', 'No']
['Japan ', 'Toyota', 'Blue ', '1990', 'Economy', 'Yes']
['USA', 'Chrysler', 'Red', '1980', 'Economy', 'No']
['Japan ', 'Honda', 'White', '1980', 'Economy', 'Yes']
```

```
[28] print("The initial value of hypothesis: ")
     hypothesis = ['Phi'] * num_attr
     print(hypothesis)
```

```
The initial value of hypothesis:
['Phi', 'Phi', 'Phi', 'Phi', 'Phi']
```

```
    for j in range(0,num_attr):
            hypothesis[j] = a[0][j];
    print("\n Find S: Finding a Maximally Specific Hypothesis\n")

    for i in range(0,len(a)):
        if a[i][num_attr]=='Yes':
                for j in range(0,num_attr):
                    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)
```

```
 Find S: Finding a Maximally Specific Hypothesis

 For Training Example No :0 the hypothesis is  ['Japan ', 'Honda', 'Blue ', '1980', 'Economy']
 For Training Example No :1 the hypothesis is  ['Japan ', 'Honda', 'Blue ', '1980', 'Economy']
 For Training Example No :2 the hypothesis is  ['Japan ', '?', 'Blue ', '?', 'Economy']
 For Training Example No :3 the hypothesis is  ['Japan ', '?', 'Blue ', '?', 'Economy']
 For Training Example No :4 the hypothesis is  ['Japan ', '?', '?', '?', 'Economy']

 The Maximally Specific Hypothesis for a given Training Examples :

['Japan ', '?', '?', '?', 'Economy']
```

2. Using EnjoySport.csv dataset

Ishan Gupta - 19BCE7467 - Find S Algorithm

```
[ ]  import random
     import csv
     attr = [['Sunny','Rainy'],
                    ['Warm','Cold'],
                    ['Normal','High'],
                    ['Strong','Weak'],
                    ['Warm','Cool'],
                    ['Same','Change']]


     num_attr = len(attr)


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

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


 The most specific hypothesis : ['Phi','Phi','Phi','Phi','Phi','Phi']
```

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

     with open('/content/EnjoySport.csv', 'r') as csvFile:
         reader = csv.reader(csvFile)
         for row in reader:
             a.append (row)
             print(row)
```

```
 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']
```

```
[ ]  print("The initial value of hypothesis: ")
     hypothesis = ['Phi'] * num_attr
     print(hypothesis)
```

```
The initial value of hypothesis:
['Phi', 'Phi', 'Phi', 'Phi', 'Phi', 'Phi']
```

```
[ ]   for j in range(0,num_attr):
            hypothesis[j] = a[0][j];
      print("\n Find S: Finding a Maximally Specific Hypothesis\n")

     for i in range(0,len(a)):
         if a[i][num_attr]=='Yes':
                 for j in range(0,num_attr):
                     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)
```

```
 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', '?', '?']
```