

# 1 : Implement and demonstrate the FIND-S algorithm

```
import random
import csv
```

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

```
data_list = []

with open('ws.csv', 'r') as csvFile:
    reader = csv.reader(csvFile)
    for row in reader:
        data_list.append(row)
```

```
num_attributes = len(attributes)
hypothesis = ['0'] * num_attributes

print("The initial value of hypothesis:", end='\n'*3)
print(hypothesis)
```

*The initial value of hypothesis:*

```
['0', '0', '0', '0', '0', '0']
```

```
# Comparing with First Training Example ( Assigning )

*first_sample, output = data_list[0]
hypothesis = first_sample[:]      # Deep copy
```

```

# Comparing with Remaining Training Examples of Given Data Set

print("Find S: Finding a Maximally Specific Hypothesis", end='\n'*3)

outer_index = 1

for *data, output in data_list:

    if output == 'Yes':
        for index, attribute in enumerate(data):
            if attribute != hypothesis[index]:
                hypothesis[index] = '?'

print("For Training Example No : {0} the hypothesis is {1} ".format( outer_index, hypothesis) )
outer_index += 1

```

*Find S: Finding a Maximally Specific Hypothesis*

*For Training Example No : 1 the hypothesis is ['Sunny', 'Warm', '?', 'Strong', '?', '?']*  
*For Training Example No : 2 the hypothesis is ['Sunny', 'Warm', '?', 'Strong', '?', '?']*  
*For Training Example No : 3 the hypothesis is ['Sunny', 'Warm', '?', 'Strong', '?', '?']*  
*For Training Example No : 4 the hypothesis is ['Sunny', 'Warm', '?', 'Strong', '?', '?']*

```

print(" The Maximally Specific Hypothesis for a given Training Examples:", end='\n'*2)
print(hypothesis)

```

*The Maximally Specific Hypothesis for a given Training Examples:*

*['Sunny', 'Warm', '?', 'Strong', '?', '?']*

```

# PS: Dataset for clarity
print(open('ws.csv').read())

```

*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*