

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

```
from pandas import DataFrame
data = DataFrame.from_csv('lab1.csv')
```

```
columnLength = data.shape[1]
```

```
print(data)
```

```
h = ['0'] * (columnLength - 1)
```

```
hp = []
```

```
hn = []
```

```
for trainingExample in data.values:
```

```
    if trainingExample[-1] != 'no':
```

```
        hp.append(list(trainingExample))
```

```
    else
```

```
        hn.append(list(trainingExample))
```

```
for i in range(len(hp)):
```

```
    for j in range(columnLength - 1):
```

```
        if (h[j] == '0'):
```

```
            h[j] = hp[i][j]
```

```
        if (h[j] != hp[i][j]):
```

```
            h[j] = '?'
```

```
    else:
```

```
        h[j] = hp[i][j]
```

```
print("\n The positive hypothesis are: ", hp)
```

```
print("\n The negative hypothesis are: ", hn)
```

```
print("\n The maximally specific hypothesis is: " + h)
```



## Output:-

sl.no	sky	AirTemp	Humidity	wind	water	forecast	EnjoySport
1	sunny	warm	normal	strong	warm	same	yes
2	sunny	warm	high	strong	warm	same	yes
3	rainy	cold	high	strong	warm	change	no
4	sunny	warm	high	strong	cool	change	yes

The positive hypothesis are:

[['sunny', 'warm', 'normal', 'strong', 'warm', 'same', 'yes']],  
 ['sunny', 'warm', 'high', 'strong', 'warm', 'same', 'yes'],  
 ['sunny', 'warm', 'high', 'strong', 'cool', 'change', 'yes']]

The negative hypothesis are:

[['rainy', 'cold', 'high', 'strong', 'warm', 'change', 'no']]

The maximally specific hypothesis is:

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

Dataset used:

sl.no	sky	AirTemp	Humidity	wind	water	forecast	EnjoySport
1	sunny	warm	normal	strong	warm	same	yes
2	sunny	warm	high	strong	warm	same	yes
3	rainy	cold	high	strong	warm	change	no
4	sunny	warm	high	strong	cool	change	yes