In [1]:

```
import numpy as np
import pandas as pd

data = pd.DataFrame(data = pd.read_csv('dataset.csv'))
concepts = np.array(data.iloc[:,0:-1])
print(concepts)

target = np.array(data.iloc[:,-1])
print(target)
```

```
[['sunny' 'hot' 'high' 'weak']
 ['sunny' 'hot' 'high' 'strong']
 ['overcast' 'hot' 'high' 'weak']
 ['rain' 'mild' 'high' 'weak']
 ['rain' 'cool' 'normal' 'weak']
 ['rain' 'cool' 'normal' 'strong']
 ['overcast' 'cool' 'normal' 'strong']
 ['sunny' 'mild' 'high' 'weak']
 ['sunny' 'cool' 'normal' 'weak']
 ['rain' 'mild' 'normal' 'weak']
 ['sunny' 'mild' 'normal' 'strong']
 ['overcast' 'mild' 'high' 'strong']
 ['overcast' 'hot' 'normal' 'weak']
 ['rain' 'mild' 'high' 'strong']]
['no' 'no' 'yes' 'yes' 'yes' 'no' 'yes' 'no' 'yes' 'yes' 'yes' 'yes' 'yes'
 'no']
```

In [2]:

```
def learn(concepts, target):
    specific_h = concepts[0].copy()
    print("Initialization Of Specific Hypothesis & General Hypothesis : ")
    print(specific_h)
    general_h=[["?" for i in range(len(specific_h))] for i in range(len(specific_h))]
    print(general_h)

    for i, h in enumerate(concepts):
        if target[i] == "yes":
            for x in range(len(specific_h)):
                if h[x] != specific_h[x]:
                    specific_h[x] = '?'
                    general_h[x][x] = '?'
                print(specific_h)
        print(specific_h)

        if target[i] == "no":
            for x in range(len(specific_h)):
                if h[x] != specific_h[x]:
                    general_h[x][x] = specific_h[x]
                else:
                    general_h[x][x] = '?'
        print("Steps of Candidate Elimination Algorithm: ",i+1)
        print(specific_h)
        print(general_h)
    indices = [i for i, val in enumerate(general_h) if val == ['?','?','?','?','?','?']]
    for i in indices:
        general_h.remove(['?','?','?','?','?','?'])
    return specific_h, general_h
```

In [3]:

```
s_final, g_final = learn(concepts, target)
```

```
Initialization Of Specific Hypothesis & General Hypothesis :
['sunny' 'hot' 'high' 'weak']
[['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?',
'?', '?', '?']]
['sunny' 'hot' 'high' 'weak']
Steps of Candidate Elimination Algorithm:  1
['sunny' 'hot' 'high' 'weak']
[['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?',
'?', '?', '?']]
['sunny' 'hot' 'high' 'weak']
Steps of Candidate Elimination Algorithm:  2
['sunny' 'hot' 'high' 'weak']
[['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?',
'?', '?', 'weak']]
['?' 'hot' 'high' 'weak']
['?' 'hot' 'high' 'weak']
['?' 'hot' 'high' 'weak']
['?' 'hot' 'high' 'weak']
['?' 'hot' 'high' 'weak']
Steps of Candidate Elimination Algorithm:  3
['?' 'hot' 'high' 'weak']
[['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?',
'?', '?', 'weak']]
['?' 'hot' 'high' 'weak']
['?' '?' 'high' 'weak']
['?' '?' 'high' 'weak']
['?' '?' 'high' 'weak']
['?' '?' 'high' 'weak']
Steps of Candidate Elimination Algorithm:  4
['?' '?' 'high' 'weak']
[['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?',
'?', '?', 'weak']]
['?' '?' 'high' 'weak']
['?' '?' 'high' 'weak']
['?' '?' '?' 'weak']
['?' '?' '?' 'weak']
['?' '?' '?' 'weak']
Steps of Candidate Elimination Algorithm:  5
['?' '?' '?' 'weak']
[['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?',
'?', '?', 'weak']]
['?' '?' '?' 'weak']
Steps of Candidate Elimination Algorithm:  6
['?' '?' '?' 'weak']
[['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?',
'?', '?', 'weak']]
['?' '?' '?' 'weak']
['?' '?' '?' 'weak']
['?' '?' '?' 'weak']
['?' '?' '?' '?']
['?' '?' '?' '?']
Steps of Candidate Elimination Algorithm:  7
['?' '?' '?' '?']
[['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?',
'?', '?', '?']]
['?' '?' '?' '?']
```

```
Steps of Candidate Elimination Algorithm:  8
['?' '?' '?' '?']
[['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?',
'?', '?', '?']]
['?' '?' '?' '?']
['?' '?' '?' '?']
['?' '?' '?' '?']
['?' '?' '?' '?']
['?' '?' '?' '?']
Steps of Candidate Elimination Algorithm:  9
['?' '?' '?' '?']
[['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?',
'?', '?', '?']]
['?' '?' '?' '?']
['?' '?' '?' '?']
['?' '?' '?' '?']
['?' '?' '?' '?']
['?' '?' '?' '?']
Steps of Candidate Elimination Algorithm:  10
['?' '?' '?' '?']
[['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?',
'?', '?', '?']]
['?' '?' '?' '?']
['?' '?' '?' '?']
['?' '?' '?' '?']
['?' '?' '?' '?']
['?' '?' '?' '?']
Steps of Candidate Elimination Algorithm:  11
['?' '?' '?' '?']
[['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?',
'?', '?', '?']]
['?' '?' '?' '?']
['?' '?' '?' '?']
['?' '?' '?' '?']
['?' '?' '?' '?']
['?' '?' '?' '?']
Steps of Candidate Elimination Algorithm:  12
['?' '?' '?' '?']
[['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?',
'?', '?', '?']]
['?' '?' '?' '?']
['?' '?' '?' '?']
['?' '?' '?' '?']
['?' '?' '?' '?']
['?' '?' '?' '?']
Steps of Candidate Elimination Algorithm:  13
['?' '?' '?' '?']
[['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?',
'?', '?', '?']]
['?' '?' '?' '?']
Steps of Candidate Elimination Algorithm:  14
['?' '?' '?' '?']
[['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?',
'?', '?', '?']]
```

In [4]:

```
print("Final Specific Hypothesis: ",s_final, sep="\n")
print("Final General Hypothesis: ",g_final, sep="\n")
```

```
Final Specific Hypothesis:
['?' '?' '?' '?']
Final General Hypothesis:
[['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?', '?', '?', '?'], ['?',
'?', '?', '?']]
```