In [10]:

```
import numpy as np
import pandas as pd



def learn(concepts, target):
    specific_h = concepts[0].copy()
    print("initialization of specific_h :")
    print(specific_h)
    print("initialization of general_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] == 1:
            for x in range(len(specific_h)):
                if h[x] != specific_h[x]:
                    specific_h[x] = '?'
                    general_h[x][x] = '?'
        if target[i] == 0:
            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 ",i+1,"\n ")
    print(specific_h)
    print("general_h ", i+1, "\n ")
    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

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

print(concepts)
print(target)

s_final, g_final = learn(concepts, target)

print("Final Specific_h:", s_final, "\n")
print("Final General_h:", g_final, "\n")
```

```
[['sunny' 'warm' 'normal' 'strong' 'warm' 'same']
 ['sunny' 'warm' 'high' 'strong' 'warm' 'same']
 ['rainy' 'cold' 'high' 'strong' 'warm' 'change']
 ['sunny' 'warm' 'high' 'strong' 'cool' 'change']]
[1 1 0 1]
initialization of specific_h :
['sunny' 'warm' 'normal' 'strong' 'warm' 'same']
initialization of general_h :
[['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?',
'?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?',
'?', '?', '?'], ['?', '?', '?', '?', '?', '?']]
(' steps of Candidate Elimination Algorithm', 4)
('Specific_h ', 4, '\n ')
['sunny' 'warm' '?' 'strong' '?' '?']
('general_h ', 4, '\n ')
[['sunny', '?', '?', '?', '?', '?'], ['?', 'warm', '?', '?', '?', '?'],
['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?',
'?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?']]
('Final Specific_h:', array(['sunny', 'warm', '?', 'strong', '?', '?'], dt
ype=object), '\n')
('Final General_h:', [['sunny', '?', '?', '?', '?', '?'], ['?', 'warm',
'?', '?', '?', '?']], '\n')
```

In [ ]: