main

In [1]:

import pandas as pd

In [2]:

def CE(concepts, target):  
 S = concepts[0].copy()  
 G = [['?' for k in range(len(S))] for k in range(len(S))]  
  
 print("Initial")  
 print(f"\tSpecific Hypothesis: {S}")  
 print(f"\tGeneral Hypothesis: {G}")  
  
 for index, row in enumerate(concepts):  
 if target[index] in ['Yes', 1, 'yes']:  
 for x in range(len(S)):  
 if row[x] != S[x]:  
 S[x] = '?'  
 G[x][x] = '?'  
  
 elif target[index] in ['No', 'no', 0]:  
 for x in range(len(S)):  
 if row[x] != S[x]:  
 G[x][x] = S[x]  
 else:  
 G[x][x] = '?'  
  
  
 G = [hypo for hypo in G if any(val != '?' for val in hypo)]  
  
 return S, G

In [3]:

data\_1 = {  
 'hair': ['blond', 'brown', 'blond', 'black', 'blond'],  
 'body': ['thin', 'thin', 'plump', 'thin', 'plump'],  
 'likesSimon': ['yes', 'no', 'yes', 'no', 'no'],  
 'pose': ['arrogant', 'natural', 'goofy', 'arrogant', 'natural'],  
 'smile': ['toothy', 'pleasant', 'pleasant', 'none', 'toothy'],  
 'smart': ['no', 'yes', 'no', 'no', 'yes'],  
 'c(d)': [1, 0, 1, 0, 0]  
}  
  
df = pd.DataFrame(data\_1)  
target = df.iloc[:, -1].values  
concepts = df.iloc[:, :-1].values  
specific\_h, general\_h = CE(concepts, target)  
  
print("Final")  
print(f"\tSpecific Hypothesis: {specific\_h}")  
print(f"\tGeneral Hypothesis: {general\_h}")

Initial  
 Specific Hypothesis: ['blond' 'thin' 'yes' 'arrogant' 'toothy' 'no']  
 General Hypothesis: [['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?']]  
Final  
 Specific Hypothesis: ['blond' '?' 'yes' '?' '?' 'no']  
 General Hypothesis: [['?', '?', 'yes', '?', '?', '?'], ['?', '?', '?', '?', '?', 'no']]

In [4]:

data\_2 = {  
 "Sky": ["Sunny", "Sunny", "Rainy", "Sunny"],  
 "AirTemp": ["Warm", "Warm", "Cold", "Warm"],  
 "Humidity": ["Normal", "High", "High", "High"],  
 "Wind": ["Strong", "Strong", "Strong", "Strong"],  
 "Water": ["Warm", "Warm", "Warm", "Cool"],  
 "Forecast": ["Same", "Same", "Change", "Change"],  
 "EnjoySport": ["Yes", "Yes", "No", "Yes"]  
}  
  
df = pd.DataFrame(data\_2)  
target = df.iloc[:, -1].values  
concepts = df.iloc[:, :-1].values  
  
specific\_h, general\_h = CE(concepts, target)  
print("Final")  
print(f"\tSpecific Hypothesis: {specific\_h}")  
print(f"\tGeneral Hypothesis: {general\_h}")

Initial  
 Specific Hypothesis: ['Sunny' 'Warm' 'Normal' 'Strong' 'Warm' 'Same']  
 General Hypothesis: [['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?']]  
Final  
 Specific Hypothesis: ['Sunny' 'Warm' '?' 'Strong' '?' '?']  
 General Hypothesis: [['Sunny', '?', '?', '?', '?', '?'], ['?', 'Warm', '?', '?', '?', '?']]