

In [3]:

```
import csv
import pandas as pd
import numpy as np

data=pd.read_csv("Pgm 2 Tennis.csv")
concepts = np.array(data.iloc[:, :-1])
print(concepts)
target = np.array(data.iloc[:, -1])

[[' Sunny' 'Warm' 'Normal' 'Strong' ' Warm' 'Same']
 [' Sunny' 'Warm' 'High' 'Strong' 'Warm' 'Same']
 [' Rainy' 'Cold' 'High' 'Strong' 'Warm' 'Change']
 [' Sunny' 'Warm' 'High' 'Strong' 'Cool' 'Change']]
```

In [7]:

```
def learn(concepts, target):
    spec = concepts[0].copy()
    gen = [["?" for i in range(len(spec))] for i in range(len(spec))]

    for i, h in enumerate(concepts):
        if target[i]=='Yes':
            for x in range(len(h)):
                if h[x] != spec[x]:
                    spec[x] = '?'
                    gen[x][x] = '?'

        else:
            for x in range(len(h)):
                if h[x] != spec[x]:
                    gen[x][x] = spec[x]
                else:
                    gen[x][x] = '?'

    indices = [
        i for i, val in enumerate(gen) if val == ['?'] * len(spec)
    ]
    for i in indices:
        gen.remove(['?'] * len(spec))

    return spec, gen
```

In [8]:

```
spec, gen = learn(concepts, target)
print("most specific : ", spec)
print("most general : ", gen)

most specific :  [' Sunny' 'Warm' '?' 'Strong' '?' '?']
most general :  [[' Sunny', '?', '?', '?', '?', '?'], ['?', 'Warm', '?',
 '?', '?', '?']]
```

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