```python
In [1]:    1  import pandas as pd
           2  import numpy as np
           3  import itertools
```

```python
In [2]:    1
           2  class FindS:
           3      def train(self, X, target):
           4          self.h = ['Φ'] * len(X.columns)
           5
           6          for idx, x in X.iterrows():
           7              if target[idx] != "Yes":
           8                  continue
           9
          10              for i, attr in enumerate(x):
          11                  if self.h[i] == 'Φ':
          12                      self.h[i] = attr
          13                  elif self.h[i] != attr:
          14                      self.h[i] = '?'
          15
          16  class ListThenEliminate:
          17      def train(self, X, target):
          18          unique_attributes = []
          19          for col in X.columns:
          20              unique_values = list(X[col].unique())
          21              unique_values.extend(['?', 'Φ'])
          22              unique_attributes.append(unique_values)
          23
          24          self.H = list(itertools.product(*unique_attributes))
          25          self.VectorSpace = []
          26          for h in self.H:
          27              if self.__is_consistent(h, (X, target)):
          28                  self.VectorSpace.append(h)
          29
          30
          31      def __is_consistent(self, h, D):
          32          for idx, x in D[0].iterrows():
          33              prediction = self.__predict(h, x)
          34              if prediction != D[1][idx]:
          35                  return False
          36          return True
          37
          38      def __predict(self, h, x):
          39          for i, attr in enumerate(x):
          40              if h[i] == 'Φ' or (h[i] != '?' and h[i] != attr):
          41                  return False
          42          return True
          43
```

```
In [3]:   1  data = pd.read_csv(r"C:\Users\sempa\Downloads\enjoysport.csv")
```

```
In [4]:   1  X = data.copy()
```

```
In [5]:   1  target = X["EnjoySport"]
```

```
In [6]:   1  display(target)
```

```
0    Yes
1    Yes
2     No
3    Yes
Name: EnjoySport, dtype: object
```

```
In [7]:   1  X = X.iloc[:,:-1]
```

```
In [8]:   1  display(X)
```

	Sky	AirTemp	Humidity	Wind	Water	Forecast
0	Sunny	Warm	Normal	Strong	Warm	Same
1	Sunny	Warm	High	Strong	Warm	Same
2	Rainy	Cold	High	Strong	Warm	Change
3	Sunny	Warm	High	Strong	Cool	Change

find s algorithm

```
In [9]:   1  find_S = FindS()
          2  find_S.train(X, target)
```

```
In [10]:  1  print("The specific hypothesis is", find_S.h)
```

```
The specific hypothesis is ['Sunny', 'Warm', '?', 'Strong', '?', '?']
```

List then eliminate

```
In [11]:   1  target = target.apply(lambda x: True if x == "Yes" else False)
```

```
In [12]:   1  list_then_eliminate = ListThenEliminate()
           2  list_then_eliminate.train(X, target)
```

```
In [13]:   1  display(list_then_eliminate.VectorSpace)
```

[]

viva

list then eleminate= taking subset of hypothesis that are consistent i.e h(x) = c(x)

```
In [ ]:    1
```