Experiment-1

Implement and demonstrate the FIND-S algorithm for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a .CSV file.

Aim: To implement and demonstrate the FIND-S algorithm for finding the most specific hypothesis based on a given set of training data samples

Algorithm:

1. Initialize h to the most specific hypothesis in H

2. For each positive training instance x

    For each attribute constraint ai in h

        If the constraint ai is satisfied by x

        Then do nothing

        Else replace ai in h by the next more general constraint that is satisfied by x

3. Output hypothesis h

Source code:

```
import csv
a = []
with open('lab1.csv', 'r') as csvfile:
    next(csvfile)
    for row in csv.reader(csvfile):
     a.append (row)
    print(a)

print("\n The total number of training instances are:",len(a))
num_attribute=len(a[0])-1
print("\n the initial hypothesis is:")
hypothesis = ['0'] * num_attribute
print(hypothesis)

for i in range(0,len(a)):
    if a[i][num_attributes]=='yes':
```

```
        print("\n instance",i+1,"is",a[i]," and is positive instance")
        for j in range(0,num_attribute):
            if hypothesis[j]=='0'or hypothesis[j]==a[i][j]:
                hypothesis[j]=a[i][j]
            else :
                hypothesis[j]= '?'
    print(" the hypothesis for the training instance", i+1,"is:",hypothesis,"\n")

if a[i][num_attribute]=='no':
    print("\n instance",i+1,"is",a[i],"and is nrgative instance hence ignored")
    print(" the hypothesis for the training instance",i+1,"is:",hypothesis,"\n")

print("\n the maximally specific hypothesis for the training instance is",hypothesis)
```

Dataset:

Example	Sky	Air Temp	Humidity	Wind	water	Forecast	Enjoy sport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Rainy	cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Cool	Change	Yes

Sample I/O:

```
[['sunny', 'warm', 'normal', 'strong', 'warm', 'same', 'yes'], ['sunny', 'warm', 'high', 'strong', 'war
m', 'same', 'yes'], ['rainy', 'cold', 'high', 'strong', 'warm', 'change', 'no'], ['sunny', 'warm', 'high', '
strong', 'cool', 'change', 'yes']]
The total number of training instances are: 4

 the initial hypothesis is:
['0', '0', '0', '0', '0', '0']

instance 1 is ['sunny', 'warm', 'normal', 'strong', 'warm', 'same', 'yes']  and is positive instance
 the hypothesis for the training instance 1 is: ['sunny', 'warm', 'normal', 'strong', 'warm', 'same'
]

 instance 2 is ['sunny', 'warm', 'high', 'strong', 'warm', 'same', 'yes']  and is positive instance
 the hypothesis for the training instance 2 is: ['sunny', 'warm', '?', 'strong', 'warm', 'same']

 the hypothesis for the training instance 3 is: ['sunny', 'warm', '?', 'strong', 'warm', 'same']
```

instance 4 is ['sunny', 'warm', 'high', 'strong', 'cool', 'change', 'yes'] and is positive instance
the hypothesis for the training instance 4 is: ['sunny', 'warm', '?', 'strong', '?', '?']
the maximally specific hypothesis for the training instance is ['sunny', 'warm', '?', 'strong', '?', '?']

Result:

Thus the program to implement and demonstrate the FIND-S algorithm to find most specific hypothesis has been successfully executed.