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.

FIND-S Algorithm

1. Initialize h to the most specific hypothesis in H

2. For each positive training instance x

    For each attribute constraint a_i in h

        If the constraint a_i is satisfied by x

        Then do nothing

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

3. Output hypothesis h

Training Examples:

Example	Sky	AirTemp	Humidity	Wind	Water	Forecast	EnjoySport
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

Program:

```python
import csv

num_attributes = 6
a = []
print("\n The Given Training Data Set \n")

with open('enjoysport.csv', 'r') as csvfile:
    reader = csv.reader(csvfile)
    for row in reader:
        a.append (row)
        print(row)

print("\n The initial value of hypothesis: ")
hypothesis = ['0'] * num_attributes
print(hypothesis)


for j in range(0,num_attributes):
        hypothesis[j] = a[0][j];


print("\n Find S: Finding a Maximally Specific Hypothesis\n")

for i in range(0,len(a)):
    if a[i][num_attributes]=='yes':
            for j in range(0,num_attributes):
                if a[i][j]!=hypothesis[j]:
                    hypothesis[j]='?'
                else :
                    hypothesis[j]= a[i][j]
    print(" For Training  instance  No:{0}  the  hypothesis  is ".format(i),hypothesis)

print("\n The Maximally Specific Hypothesis for a given Training Examples :\n")
print(hypothesis)
```

Data Set:

sunny	warm	normal	strong	warm	same	yes
sunny	warm	high	strong	warm	same	yes
rainy	cold	high	strong	warm	change	no
sunny	warm	high	strong	cool	change	yes

Output:

```
The Given Training Data Set

['sunny', 'warm', 'normal', 'strong', 'warm', 'same', 'yes']
['sunny', 'warm', 'high', 'strong', 'warm', 'same', 'yes']
['rainy', 'cold', 'high', 'strong', 'warm', 'change', 'no']
['sunny', 'warm', 'high', 'strong', 'cool', 'change', 'yes']

The initial value of hypothesis:
['0', '0', '0', '0', '0', '0']

Find S: Finding a Maximally Specific Hypothesis

For Training Example No:0 the hypothesis is
['sunny', 'warm', 'normal', 'strong', 'warm', 'same']

For Training Example No:1 the hypothesis is
['sunny', 'warm', '?', 'strong', 'warm', 'same']

For Training Example No:2 the hypothesis is
'sunny', 'warm', '?', 'strong', 'warm', 'same']

For Training Example No:3 the hypothesis is
'sunny', 'warm', '?', 'strong', '?', '?']

The Maximally Specific Hypothesis for a given Training Examples:
```

['sunny', 'warm', '?', 'strong', '?', '?']