

Find-S Algorithm

By Harsh R - 1BG17CS031

1. Program:

```
import csv

h = [['%', '%', '%', '%', '%', '%']]

examples = []

with open('Training_examples.csv') as csv_file:
    readcsv = csv.reader(csv_file, delimiter = ',')
    examples = list(readcsv)

print("The given training examples are: ")

for i in examples:
    print(i)

print("The positive training examples are: ")

for i in examples:
    if i[-1] == 'Yes':
        print(i)

print("Steps of Find-S algorithm are: ")

print(h)

#initialise h to the most specific hypothesis

pos_e = []

for i in examples:
    if i[-1] == 'Yes':
        pos_e = examples[: -1]

for x in examples:
    if x[-1] == 'Yes':
        j = 0
```

```

        h = examples[j]

        print(h[:-1])

        for i in range(0,6):

            if h[i] != examples[j][i]:

                h[i] = '?'

            else:

                j += 1

        else:

            continue

    print(f"The most specific hypothesis: {h[:-1]}")

```

2. Output

The image shows two side-by-side windows from a Windows desktop. The left window is titled 'Python 3.8.2 Shell' and displays the output of a Python script. The output includes the training examples, positive examples, and the final hypothesis found by the Find-S algorithm. The right window is titled 'script.py - D:\7th Sem\ML Lab\Session 2\script.py (3.8.2)' and shows the source code of the script, which implements the Find-S algorithm. The code reads training examples from a CSV file, identifies positive examples, and iteratively refines a hypothesis until it is the most specific one that covers all positive examples.

```

Python 3.8.2 Shell
File Edit Shell Debug Options Window Help
Python 3.8.2 (tags/v3.8.2:7b3ab59, Feb 25 2020, 23:03:10) [MSC v.1916 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: D:\7th Sem\ML Lab\Session 2\script.py =====
The given training examples are:
[('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 positive training examples are:
[('Sunny', 'Warm', 'Normal', 'Strong', 'Warm', 'Same', 'Yes')]
[('Sunny', 'Warm', 'High', 'Strong', 'Warm', 'Same', 'Yes')]
[('Sunny', 'Warm', 'High', 'Strong', 'Cool', 'Change', 'Yes')]
Steps of Find-S algorithm are:
[[ '?', '?', '?', '?', '?', '?' ]]
[('Sunny', 'Warm', 'Normal', 'Strong', 'Warm', 'Same')]
[('Sunny', 'Warm', '?', 'Strong', '?', '?')]
[('Sunny', 'Warm', '?', 'Strong', '?', '?')]
The most specific hypothesis: ['Sunny', 'Warm', '?', 'Strong', '?', '?']
>>>

script.py - D:\7th Sem\ML Lab\Session 2\script.py (3.8.2)
File Edit Format Run Options Window Help
import csv
h = [['?', '?', '?', '?', '?', '?']]
examples = []
with open('Training_examples.csv') as csv_file:
    readcsv = csv.reader(csv_file, delimiter=',')
    examples = list(readcsv)
print("The given training examples are: ")
for i in examples:
    print(i)
print("The positive training examples are: ")
for i in examples:
    if i[-1] == 'Yes':
        print(i)
print("Steps of Find-S algorithm are: ")
print(h)
#initialise h to the most specific hypothesis
pos_e = []
for i in examples:
    if i[-1] == 'Yes':
        pos_e = examples[i-1]
for x in pos_e:
    if x[-1] == 'Yes':
        j = 0
        h = examples[j]
        print(h[:-1])
        for i in range(0,6):
            if h[i] != examples[j][i]:
                h[i] = '?'
            else:
                j += 1
        else:
            continue
print(f"The most specific hypothesis: {h[:-1]}")

```