

exp2.py

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1  '''exp-2:For a given set of training data examples stored in a .CSV file, implement and
2  demonstrate the Candidate-Elimination algorithm to output a description of
3  the set of all hypotheses consistent with the training examples
4  '''
5  import csv
6  with open('tennis.csv','r') as file:
7      reader = csv.reader(file)
8      data = list(reader)
9
10 def candidate_elimination(data):
11     # Initialize the most specific hypothesis s
12     s = data[0][:-1] # The first example (excluding the label)
13     # Initialize the most general hypothesis g
14     g = [['?' for i in range(len(s))] for j in range(len(s))]
15
16     for instance in data:
17         if instance[-1]=='True': # If the instance is positive
18             for j in range(len(s)):
19                 if instance[j] != s[j]:
20                     s[j] = '?'
21                     g[j][j] = '?'
22         else: # If the instance is negative
23             for j in range(len(s)):
24                 if instance[j] != s[j]:
25                     g[j][j] = s[j]
26                 else:
27                     g[j][j] = "?"
28
29     print(f"\nSteps of Candidate Elimination Algorithm")
30     print("Specific hypothesis:", s)
31     print("General hypothesis:", g)
32
33     gh = []
34     for i in g:
35         if '?' not in i:
36             gh.append(i)
37
38     print("\nFinal specific hypothesis:\n", s)
39     print("\nFinal general hypothesis:\n", gh)
40
41 if __name__ == "__main__":
42     candidate_elimination(data)
43
44 '''output
45 Steps of Candidate Elimination Algorithm
46 Specific hypothesis: ['Sunny', 'Warm', 'Normal', 'Strong', 'Warm', 'Same']
47 General hypothesis: [['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?',
48 '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'],
49 ['?', '?', '?', '?', '?', '?']]
48
49 Steps of Candidate Elimination Algorithm
50 Specific hypothesis: ['Sunny', 'Warm', '?', 'Strong', 'Warm', 'Same']

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51 General hypothesis: [['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?',  
    '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'],  
    ['?', '?', '?', '?', '?', '?']]  
52  
53 Steps of Candidate Elimination Algorithm  
54 Specific hypothesis: ['Sunny', 'Warm', '?', 'Strong', 'Warm', 'Same']  
55 General hypothesis: [['Sunny', '?', '?', '?', '?', '?'], ['?', 'Warm', '?', '?', '?', '?'],  
    ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'],  
    ['?', '?', '?', '?', '?', 'Same']]  
56  
57 Steps of Candidate Elimination Algorithm  
58 Specific hypothesis: ['Sunny', 'Warm', '?', 'Strong', '?', '?']  
59 General hypothesis: [['Sunny', '?', '?', '?', '?', '?'], ['?', 'Warm', '?', '?', '?', '?'],  
    ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'],  
    ['?', '?', '?', '?', '?', '?']]  
60  
61 Final specific hypothesis:  
62 ['Sunny', 'Warm', '?', 'Strong', '?', '?']  
63  
64 Final general hypothesis:  
65 []  
66 ''
```