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Roll no:-95 pratical no:- 3

Pratical name:- implement to candidate elimination inductive learning algorithm

import numpy as np  
import pandas as pd  
data = pd.read\_csv("C:/Users/patil/Documents/sheet2.csv")  
concepts = np.array(data.iloc[:,0:-1])  
print("\nInstance are:\n",concepts)  
target = np.array(data.iloc[:,-1])  
print("\nTarget Values are:",target)  
def learn(concepts, target):  
 specific\_h = concepts[0].copy()  
 print("\nInitialization of specific\_h and general\_h")  
 print("\nSpecific Boundary: ",specific\_h)  
 general\_h = [["?" for i in range(len(specific\_h))]for i in range(len(specific\_h))]  
 print("\nGeneric Boundary: ",general\_h)  
 for i, h in enumerate(concepts):  
 print("\nInstance", i+1 , "is", h)  
 if target[i] == "yes":  
 print("Instance is positive ")  
 for x in range(len(specific\_h)):  
 if h[x] != specific\_h [x]:  
 specific\_h[x] ='?'  
 general\_h[x][x] ='?'  
 else:  
 print("Instance is Negative ")  
 for x in range(len(specific\_h)):  
 if h[x] != specific\_h[x] and specific\_h[x] !='?':  
 general\_h[x][x] = specific\_h[x]  
 else:  
 general\_h[x][x] = '?'  
 print("specific Boundary after", i+1,"Instance is",specific\_h)  
 print("Generic Boundary after", i+1, "Instance is", general\_h)  
 print("\n")  
  
 indices = [ i for i,val in enumerate(general\_h) if val == ['?','?','?','?','?','?']]  
 for i in indices:  
 general\_h.remove(['?','?','?','?','?','?'])  
 return specific\_h, general\_h  
  
  
s\_final, g\_final = learn(concepts, target)  
print("Final Specific\_h:", s\_final, sep="\n")  
print("Final General\_h:", g\_final, sep="\n")

output:-

Instance are:

[['sunny' 'warm' 'Normal' 'strong' 'warm' 'same']

['sunny' 'warm' 'High' 'strong' 'warm' 'same']

['sunny' 'cold' 'High' 'strong' 'warm' 'same']

['Rainy' 'cold' 'Normal' 'strong' 'cold' 'change']

['sunny' 'cold' 'High' 'weak' 'warm' 'change']

['sunny' 'cold' 'Normal' 'weak' 'warm' 'same']

['Rainy' 'warm' 'High' 'weak' 'cold' 'change']]

Target Values are: ['yes' 'yes' 'yes' 'no' 'no' 'yes' 'no']

Initialization of specific\_h and general\_h

Specific Boundary: ['sunny' 'warm' 'Normal' 'strong' 'warm' 'same']

Generic Boundary: [['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?']]

Instance 1 is ['sunny' 'warm' 'Normal' 'strong' 'warm' 'same']

Instance is positive

specific Boundary after 1 Instance is ['sunny' 'warm' 'Normal' 'strong' 'warm' 'same']

Generic Boundary after 1 Instance is [['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?']]

Instance 2 is ['sunny' 'warm' 'High' 'strong' 'warm' 'same']

Instance is positive

specific Boundary after 2 Instance is ['sunny' 'warm' '?' 'strong' 'warm' 'same']

Generic Boundary after 2 Instance is [['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?']]

Instance 3 is ['sunny' 'cold' 'High' 'strong' 'warm' 'same']

Instance is positive

specific Boundary after 3 Instance is ['sunny' '?' '?' 'strong' 'warm' 'same']

Generic Boundary after 3 Instance is [['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?']]

Instance 4 is ['Rainy' 'cold' 'Normal' 'strong' 'cold' 'change']

Instance is Negative

specific Boundary after 4 Instance is ['sunny' '?' '?' 'strong' 'warm' 'same']

Generic Boundary after 4 Instance is [['sunny', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', 'warm', '?'], ['?', '?', '?', '?', '?', 'same']]

Instance 5 is ['sunny' 'cold' 'High' 'weak' 'warm' 'change']

Instance is Negative

specific Boundary after 5 Instance is ['sunny' '?' '?' 'strong' 'warm' 'same']

Generic Boundary after 5 Instance is [['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', 'strong', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', 'same']]

Instance 6 is ['sunny' 'cold' 'Normal' 'weak' 'warm' 'same']

Instance is positive

specific Boundary after 6 Instance is ['sunny' '?' '?' '?' 'warm' 'same']

Generic Boundary after 6 Instance is [['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', 'same']]

Instance 7 is ['Rainy' 'warm' 'High' 'weak' 'cold' 'change']

Instance is Negative

specific Boundary after 7 Instance is ['sunny' '?' '?' '?' 'warm' 'same']

Generic Boundary after 7 Instance is [['sunny', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', 'warm', '?'], ['?', '?', '?', '?', '?', 'same']]

Final Specific\_h:

['sunny' '?' '?' '?' 'warm' 'same']

Final General\_h:

[['sunny', '?', '?', '?', '?', '?'], ['?', '?', '?', '?', 'warm', '?'], ['?', '?', '?', '?', '?', 'same']]

Process finished with exit code 0