Machine Learning

Lab 6- Candidate Eliminate Algorithm

Dataset:

Size	Color	Shape	Class
Big	Red	Circle	No
Small	Red	Triangle	No
Small	Red	Circle	Yes
Big	Blue	Circle	No
Small	Blue	Circle	Yes

Code:

```
import pandas as pd

data = pd.read_csv("Data.csv")

# Initialize the specific and general hypotheses
specific_hypothesis = [None] * (len(data.columns) - 1)
general_hypothesis = [["?" for i in range(len(data.columns) - 1)]]

for i, row in data.iterrows():
    if row.iloc[-1] == "Yes":
        for j in range(len(row) - 1):
            if specific_hypothesis[j] == None:
                specific_hypothesis[j] = row[j]
            elif specific_hypothesis[j] != row[j]:
                specific_hypothesis[j] = "?"
        for j in range(len(general_hypothesis)):
            if general_hypothesis[j][0] != "?":
                for k in range(len(row) - 1):
                    if general_hypothesis[j][k] != row[k]:
                        general_hypothesis[j][k] = "?"
            else:
                break
        general_hypothesis = [h for h in general_hypothesis if "?" not in h]
    else:
        for j in range(len(general_hypothesis)):
            if general_hypothesis[j][0] != "?":
                if general_hypothesis[j] != list(row[:-1]):
                    general_hypothesis[j] = ["?" if general_hypothesis[j][k] != row[k]
                                             else general_hypothesis[j][k] for k in range(len(row) - 1)]
            else:
                break
        specific_hypothesis = [None if specific_hypothesis[j] == row[j]
                               else specific_hypothesis[j] for j in range(len(row) - 1)]
        specific_hypothesis = [specific_hypothesis[j] if specific_hypothesis[j]
                               != "?" else None for j in range(len(row) - 1)]
        general_hypothesis = [h for h in general_hypothesis if "?" not in h]
        general_hypothesis += [[specific_hypothesis[j] if specific_hypothesis[j]
                                != None else "?" for j in range(len(row) - 1)]]

    # Print the current step of the algorithm
    print("Specific Hypothesis: ", specific_hypothesis)
    print("General Hypothesis: ", general_hypothesis)
    print("\n")
```

Output:

```
Specific Hypothesis:  [None, None, None]
General Hypothesis:  [['?', '?', '?']]


Specific Hypothesis:  [None, None, None]
General Hypothesis:  [['?', '?', '?']]


Specific Hypothesis:  [None, None, None]
General Hypothesis:  [['?', '?', '?']]


Specific Hypothesis:  ['Small', 'Red', 'Circle']
General Hypothesis:  []


Specific Hypothesis:  ['Small', 'Red', None]
General Hypothesis:  [['Small', 'Red', '?']]


Specific Hypothesis:  ['Small', '?', 'Circle']
General Hypothesis:  []
```

Submitted by:

Harshita Pasupuleti

21BCE8421