2. For a given set of training data examples stored in a .CSV file, implement and demonstrate the Candidate-Elimination algorithm in python to output a description of the set of all hypotheses consistent with the training examples

Program:

```
import csv
import copy
# Load CSV data
with open("training_data.csv") as f:
    data = list(csv.reader(f))
# Separate attributes and target
concepts = data[1:]  # remove header
attributes = [row[:-1] for row in concepts]
target = [row[-1] for row in concepts]
#Initialize S and G
num_attributes = len(attributes[0])
S = ['0'] * num_attributes
G = [['?'] * num_attributes]
print("Initial S:", S)
print("Initial G:", G)
print("\n")
for i in range(len(attributes)):
    if target[i] == "Yes":  # Positive example
        for j in range(num_attributes):
            if S[j] == '0':
                S[j] = attributes[i][j]
            elif S[j] != attributes[i][j]:
                S[j] = '?'
        # Remove inconsistent hypotheses from G
        G = [g for g in G if all(g[k] == '?' or g[k] == S[k] for k in range(num_attributes))]
```

```
    else:  # Negative example
        new_G = []
        for g in G:
            for j in range(num_attributes):
                if g[j] == '?':
                    if attributes[i][j] != S[j]:
                        new_hypothesis = copy.deepcopy(g)
                        new_hypothesis[j] = S[j]
                        new_G.append(new_hypothesis)
        G = new_G
    print("Step", i+1)
    print("S:", S)
    print("G:", G)
    print("\n")
print("Final Specific Hypothesis (S):", S)
print("Final General Hypotheses (G):", G)
```

Output: