

FIND-S Algorithm Implementation

```
def find_s_algorithm(data, target):
    """
    data : list of training examples (each example is list of attributes + target)
    target : label that represents positive class to learn (e.g. 'Yes')
    """

    # Step 1: Initialize hypothesis to the most specific hypothesis
    hypothesis = ['0'] * (len(data[0]) - 1)

    # Step 2: Iterate through training examples
    for example in data:
        attributes = example[:-1]
        label = example[-1]

        # Only consider positive examples
        if label == target:
            for i in range(len(attributes)):
                if hypothesis[i] == '0': # replace initial placeholders
                    hypothesis[i] = attributes[i]
                elif hypothesis[i] != attributes[i]: # generalize
                    hypothesis[i] = '?' # '?' means any attribute value

    return hypothesis

# Example dataset
# Each example: [Attributes..., Target]
dataset = [
    ['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']
]

# Running FIND-S
final_hypothesis = find_s_algorithm(dataset, target='Yes')

print("Final Hypothesis:", final_hypothesis)
```