STARTOON LABS
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AI and ML Assignment

Coding Section : -

1. Could we sum it?

Let Ankur has given a large weight W, and a list of smaller weights in an array. He needs to write a code in order to find "can we form weight W or not, using smaller weights". He only knows dp solution. Could you write a code solution for him without using dp.

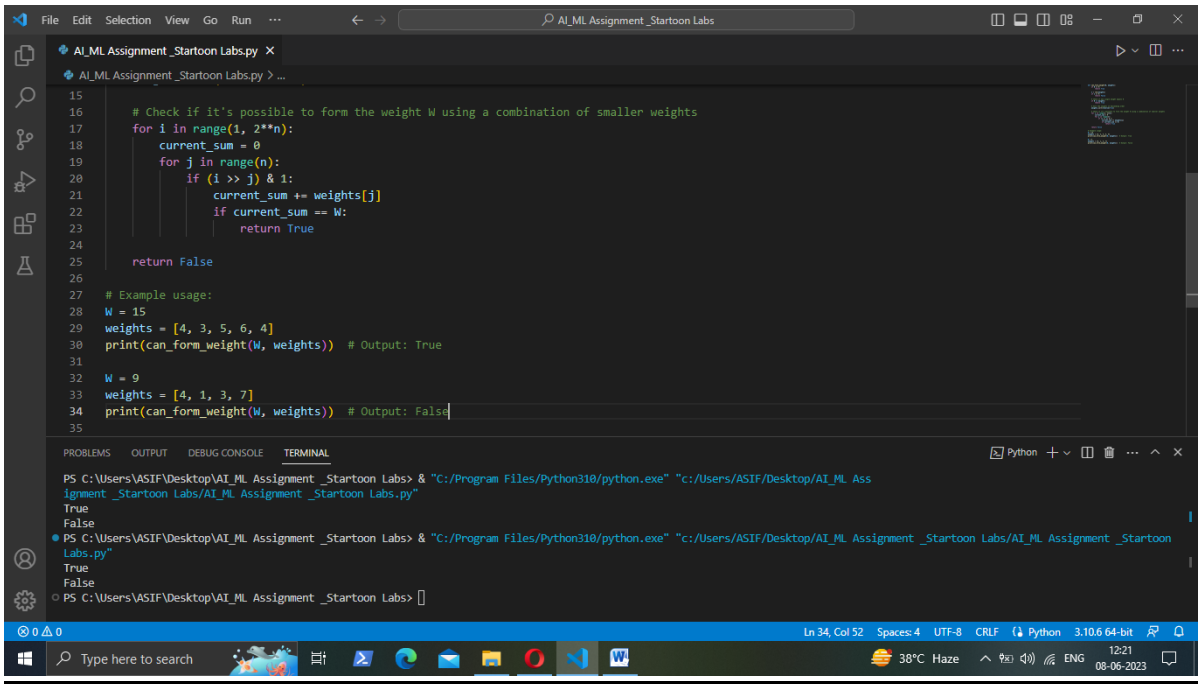
Constraint: - list size <= 12

Sample Input1: -
W = 15
list = {4, 3, 5, 6, 4}
Output: - True
Explanation: -
15 =4 + 5 + 6.

Sample Input2: -
W = 9
list = {4, 1, 3, 7}
Output: - False.
Explanation: - There is no way to sum up 7.

Solution Code:

```
def can_form_weight(W, weights):
    if W == 0:
        return True

    n = len(weights)
    if n == 0:
        return False

    # Check if any single weight equals W
    if W in weights:
        return True

    # Sort the weights in descending order
    weights.sort(reverse=True)

    # Check if it's possible to form the weight W using a combination of smaller weights
    for i in range(1, 2**n):
        current_sum = 0
        for j in range(n):
            if (i >> j) & 1:
                current_sum += weights[j]
                if current_sum == W:
                    return True

    return False

# Example usage:
W = 15
weights = [4, 3, 5, 6, 4]
print(can_form_weight(W, weights))  # Output: True

W = 9
weights = [4, 1, 3, 7]
print(can_form_weight(W, weights))  # Output: False
```



Descriptive Section : -

1. How Do You Handle Missing or Corrupted Data in a Dataset?

Answere :

Handling missing or corrupted data in a dataset is an important step in data preprocessing. There are several approaches to deal with missing or corrupted data, including:

Dropping missing data: If the missing data is minimal, you can choose to drop the rows or columns with missing values. However, this should be done cautiously as it can result in loss of valuable information.

Imputation: Missing values can be filled in using various imputation techniques. Simple imputation methods include filling missing values with the mean, median, or mode of the corresponding feature. More advanced techniques include regression imputation or using machine learning models to predict missing values based on other features.

Creating a separate category: For categorical data, missing values can be treated as a separate category. This can be useful when the fact that data is missing has significance or represents a meaningful category.

Using algorithms that handle missing data: Some machine learning algorithms are capable of handling missing data internally. These algorithms automatically learn how to best deal with missing values during the training process.

2. What Are the Three Stages of Building a Model in Machine Learning?

Answere :

Data preprocessing: This stage involves preparing the data for training the model. It includes tasks such as cleaning the data, handling missing values, encoding categorical variables, scaling numerical features, and splitting the data into training and testing sets.

Model training: In this stage, the prepared data is used to train the machine learning model. The model learns patterns and relationships in the data through an iterative process. The choice of the model depends on the problem and the type of learning (e.g., supervised, unsupervised, or reinforcement learning).

Model evaluation and deployment: After training the model, it needs to be evaluated to assess its performance and generalization capability. Evaluation metrics such as accuracy, precision, recall, F1 score, or mean squared error are used to measure the model's effectiveness. If the model performs well, it can be deployed to make predictions on new, unseen data.