

School Quiz II

The math teacher in a primary school wrote on board a list of 'K' positive integers starting by 1. The teacher gave the students another number 'N' and asked the students to collect from board the **minimum number** of the integers whose sum equals to 'N'. Note: **they can use the same integer many times**. The winner is the first student who reaches the right answer. Determine the efficient algorithm that the winner used to find the minimum number of integers whose sum equals to 'N'.

Requirements:

Implement TWO functions,

1. First function: return the min number of integers.
2. Second function: return the numbers themselves. If more than one option is available, return any of them.

Example

K = { 1, 5, 10, 20, 25 }

N = 30 -> 2 integers (1 x 20, 1 x 10) or (1 x 25, 1 x 5)

N = 107 -> 7 integers (4 x 25, 1 x 5, 2 x 1)

N = 40 -> 2 integers (2 x 20)

Function:

First Function:

```
int SolveValue(int N, int[] numbers)
<returns>minimum number of integers whose sum equals to 'N'
```

Second Function:

```
int[] ConstructSolution(int N, int[] numbers)
<returns>the numbers themselves whose sum equals to 'N'
```

C# Help

ARRAYS:

Creating 1D array

```
int [] array = new int [size]
```

Creating 2D array

```
int [,] array = new int [size1, size2]
```

Length of 1D array

```
int arrayLength = my1DArray.Length
```

Length of 2D array

```
int array1stDim = my2DArray.GetLength(0)
```

```
int array2ndDim = my2DArray.GetLength(1)
```

Sorting single array

Sort the given array in ascending order

```
Array.Sort(items);
```

Sorting parallel arrays

Sort the first array "master" and re-order the 2nd array "slave" according to this sorting

```
Array.Sort(master, slave);
```