



## 2166 - Move the Water

Latin America - South America - 2000/2001

You have three jars containing water. Each jar has associated a capacity indicating the maximum amount of water it can contain. Your wish is to have a certain amount of water in each jar. The initial content of each jar, its capacity, and the desired content, are all non negative integers; in addition, the capacities are between 1 and 150. You have nothing but the jars to help you in achieving your goal. So the only way to obtain the desired content in each jar is to make a sequence of movements of water. In a movement of water you pour a certain amount of water from one jar to another jar. We call the first jar source and the second jar destination. While moving water two situations can occur: If the current content of the source jar is not enough to complete the capacity of the destination jar, then all the water contained in the source jar is moved to the destination jar; otherwise, only the exact amount of water needed to complete the destination jar is moved from the source jar. Under no circumstances you can use additional water or throw away water. Your task is to determine the minimum number of movements required to obtain the desired amount of water in each jar.

### Input

The input file contains a certain number of test cases for this problem. Each test case is given in a single line containing nine values  $c_1, c_2, c_3, a_1, a_2, a_3, b_1, b_2, b_3$ ; these values are separated by an arbitrary number of blank spaces. The value  $c_i$  is the capacity of the  $i$ -th jar,  $a_i$  is its initial content, and  $b_i$  is the desired content for the jar. In the last line of the file  $c_1$  has value equal to 0; this line should not be processed.

### Output

For each test case in the input file, the output file must contain a line with the minimum number of movements required to obtain the desired content in each jar. If for a given test case there is no solution, you must write the value -1 instead of the number of movements.

### Sample Input

```
5 4 1 1 0 1 0 2 0
5 4 1 1 0 1 0 3 0
5 4 1 1 0 1 0 0 2
5 4 1 1 0 1 1 0 1
5 4 1 0 4 0 3 0 1
0 1 1 0 0 0 0 0 0
```

### Sample Output

```
2
-1
-1
0
2
10
```

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