

# CCC '13 S2 - Bridge Transport

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## Canadian Computing Competition: 2013 Stage 1, Senior #2

A train of railway cars attempts to cross a bridge. The length of each car is 10m but their weights might be different. The bridge is 40m long (thus can hold 4 train cars at one time). The bridge will crack if the total weight of the cars on it at one time is greater than a certain weight. The cars are numbered starting at 1, going up to  $N$ , and they cross the bridge in that order (i.e., 1 immediately followed by 2, which is immediately followed by 3, and so on).

What is the largest number  $T$  of railway cars such that the train of cars  $1 \dots T$  (in order) can cross the bridge?

## Input Specification

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The first line of input is the maximum weight  $W$  ( $1 \leq W \leq 100\,000$ ) that the bridge can hold at any particular time. The second line of input is the number  $N$  ( $1 \leq N \leq 100\,000$ ) which is the number of railway cars that we wish to move across the bridge. On each of the next  $N$  lines of input, there will be a positive integer  $w_i$  ( $1 \leq i \leq N$ ,  $1 \leq w_i \leq 100\,000$ ) which represents the weight of the  $i^{\text{th}}$  railway car in the sequence.

## Output Specification

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Your output should be a non-negative integer representing the maximum number of railway cars that can be brought across the bridge in the order specified.

## Sample Input 1

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100
6
50
30
10
10
40
50
```

## Output for Sample Input 1

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5
```

## Explanation of Output for Sample Input 1

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The first four railway cars have total weight  $50 + 30 + 10 + 10 = 100$ , which is not greater than what the bridge can hold. When the first railway car leaves, and the next comes on, we have a total weight of  $30 + 10 + 10 + 40 = 90$ , which is not greater than what the bridge can hold. The last four cars would cause the bridge to break, since  $10 + 10 + 40 + 50 = 110$  which is greater than the bridge can hold. So, only the first 5 railway cars can be taken across the bridge.

## Sample Input 2

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```
100
3
150
1
1
```

## Output for Sample Input 2

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0
```

## Explanation of Output for Sample Input 2

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When the first railway car enters the bridge, its weight of 150 will exceed the maximum weight the bridge can hold. Thus, we cannot bring any railway cars across the bridge.