

Composable Columns (columns)

By selling his marvellous mega-mansion, Edoardo was able to cover the OIS deficit and even save some money to build a more humble replacement. However, the only affordable way left is to use some of the N discounted prefabricated columns of length L_i available from exhausting stocks. These columns may be used for their exact length L_i , or may be combined in **pairs** (i, j) to produce a single column of length $L_i + L_j$. *Combining more than two columns together is never allowed for safety reasons.*

The new OIS building will require M columns each of the same height H (produced from one or two of the available prefabricated columns). This height has to be at least T in order to fit all the workers and equipments, and of course, the smaller the building, the cheaper the final price. Help Edoardo determine the minimal height H for which a working building can be made!

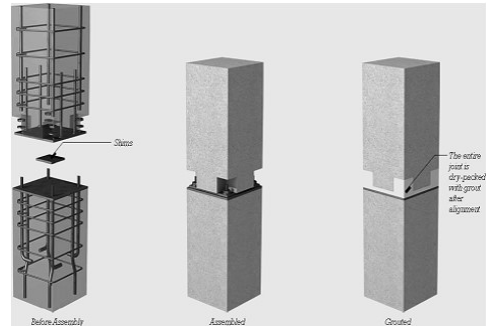



Figure 1: Instructions for joining two (and no more) prefabricated columns.

 Among the attachments of this task you may find a template file `columns.*` with a sample incomplete implementation.

Input

The first line contains integers N, M, T . The second line contains N integers L_i .

Output




You need to write a single line with an integer: the minimal $H \geq T$ such that M columns of length H are constructible from the N available. If there is no such H , you should output the string 'IMPOSSIBLE'.




Constraints

- $1 \leq M \leq N \leq 1\,000\,000$.
- $1 \leq T \leq 10\,000$.
- $1 \leq L_i \leq 10\,000$ for each $i = 0 \dots N - 1$.

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

- **Subtask 1** (0 points) Examples.

- **Subtask 2** (15 points) $L_i = L_j$ for each i, j .

- **Subtask 3** (10 points) $M = 1$.


- **Subtask 4** (30 points)  $N, T \leq 500$.
- **Subtask 5** (25 points)  $N \leq 10\,000$.
- **Subtask 6** (20 points)  No additional limitations.

Examples

input	output
8 3 100 100 30 50 40 50 80 40 30	IMPOSSIBLE
8 3 50 100 30 50 40 50 80 40 30	80

Explanation

In the **first sample case**, only two columns of height 100 can be obtained (a single 100 and 50 + 50, as triplets like 40 + 30 + 30 are not allowed). Only one column of height 110 is constructible (80 + 30), one of height 120 (80 + 40), two of height 130 (100 + 30 and 80 + 50), and one each of the heights 140, 150, 180 (in all three cases involving the 100 column). Thus, it is impossible to obtain three columns of the same height above 100.

In the **second sample case**, only two columns of height 50 are readily available, and combining does not help. Only one column of height 60 is constructible (30 + 30), two of height 70 (both 30 + 40), and four of height 80 (one 80, two 50 + 30 and a 40 + 40). Thus, the required height is 80.