IOI & EGOI Team Selection Test

2025

Bounded Negatives Subsequence Sum

Time limit: 4 seconds **Memory limit: 1024 MB**

You have an array A with size N and value S, and you need to choose a subsequence from the array. You need to find the minimum possible sum that is greater than or equal to S, but you can't include more than 3 negative values consecutively in the subsequence.

If a solution doesn't exist, then print `Impossible`.

Note: A subsequence is any sequence that can be derived from an array by deleting some or no elements without changing the order of the remaining elements.

Input

The first line contains two space-separated integers: N ($2 \leq N \leq 40$) and S ($-10^9 \leq S \leq 10^9$). The second line contains N integers A_i ($-10^9 \leq A_i \leq 10^9$).

Output

Print the minimum summation you can get. If there is no solution, print `Impossible`.

Subtasks

Subtask #	Constraints	Points
1	All elements of the array are either 1 or -1	15
2	$N \leq 5$	15
3	$N \leq 18$	30
4	$N \leq 40$	40

Examples

Input

```
4 8
12 -1 -2 0
```

Output

```
9
```

Input

```
2 2
-1 1
```

Output

Impossible