Operators (new ver)

Given a sequence a1, a2,..., an and a integer S, your task is find a way to insert an operator '+' , '-', '.', '~' to every neighbor pair of A, that the result of the expression after insert equal to S.

Note that :

- a . b = a + 2 * b
- a ~ b = a - 2 * b

Input

First line : N and S ($2 \le N \le 22$, $|S| \le 5 * 10^{16}$)

Second line : N integers, a1, a2,..., an ($|ai| \le 10^{15}$)

Output

If there are way(s) to insert, output any of them, otherwise output "Impossible" (without quotes).

Example

Input:
9 5
1 2 3 4 5 6 7 8 9

Output:
-~~~++++

Input:
3 -1
-2 5 7

Output:
Impossible

Details:

In first test case : 1 - 2 - 2 * 3 - 2 * 4 - 2 * 5 + 6 + 7 + 8 + 9 = 5

You may want to try another version here.