Task: MAG
Magical stones

Day 1. Source file `mag.*` *19–04–2008*

Available memory: 32 MB.

Famous stones Xi-*n*-*k* can only be found in Wonderland. Such a stone is simply a granite board with an inscription consisting only of letters `X` and `I`. Each board contains exactly n letters. There are not more than k positions in each board where letters `X` and `I` are next to each other.

The top and bottom sides of the stones are not fixed, so the stones can be rotated upside-down. For instance two figures below depict exactly the same stone:

Figure 1: Two ways of looking at the same stone. This stone is of type Xi-8-3, but also Xi-8-4 (and also of any type Xi-8-k for $k \geq 3$).

No two magic stones in Wonderland are the same, i.e. no two stones contain the same inscription (remember that the upside-down rotation of a stone is allowed).

If it is possible to read the inscription of some stone in two different ways (using the upside-down rotation) then the *canonical representation* of the stone is defined as the lexicographically less* of these two ways of reading the inscription.

If a stone's inscription is symmetrical, i.e. the upside-down rotation does not change it, then its canonical representation is defined as the unique way of reading this inscription.

Example: There are exactly 6 stones of type Xi-3-2. Their canonical representations written in lexicographical order are: `III`, `IIX`, `IXI`, `IXX`, `XIX` and `XXX`.

Alice is a well-known expert on the Xi-*n*-*k* stones from Wonderland. She would like to create a lexicographical index of the canonical representations of all stones of type Xi-*n*-*k* (for some specific values of n and k). What inscription should be written at position i of the index, for a given value of i?

Task

Write a programme which:

- reads numbers n, k and i from the standard input,
- determines the i^{th} (in the lexicographical order) canonical representation of a Xi-*n*-*k* stone,
- writes the result to the standard output.

Input

The first and only line of the standard input contains three integers n, k and i ($0 \leq k < n \leq 60$, $0 < i < 10^{18}$) separated by single spaces.

*We say that inscription A is lexicographically less than B (assuming that lengths of A and B are the same) if A contains letter `I` and B contains letter `X` at the first position where the inscriptions differ.

Output

The first and only line of the standard output should contain the i^{th} (in the lexicographical order) canonical representation of a Xi-*n*-*k* stone.

If the number of Xi-*n*-*k* stones is less than *i* then the first and only line of output should contain expression `NO SUCH STONE`.

Example

For the input data:

```
3 2 5
```

the correct result is:

```
XIX
```

and for the input data:

```
3 2 7
```

the correct result is:

```
NO SUCH STONE
```