

TLE '17 Contest 2 P5 - Crew Selection Test

Time limit: 8.0s **Memory limit:** 256M

Fax McClad, Croneria's most independent bounty hunter, has decided to form a crew of P people to operate his spacecraft carrier, the Great Fax.

The people that Fax can choose from are numbered from 1 to N . Among all pairs of people, they either know each other or don't know each other.

Fax wants the crew to be able to work together flawlessly, so the crew should follow one of these two conditions:

- Among all pairs of people in the crew, they know each other.
- Among all pairs of people in the crew, they don't know each other.

This is because people tend to prefer to work with people they know than those they don't know. Fax wants to ensure that each person will want to work with others equally.



Fax and the Great Fax.

In order to accomplish this, Fax can perform the following three actions:

- **A x**: Ask person x ($1 \leq x \leq N$) to categorize all of the people that they know and don't know. Because Fax is lazy, he will do this at most Q times.
- **C a b ...**: Create a crew containing people with **distinct** numbers a, b, \dots . There should be P people in this crew.
- **C -1**: Give up because there is no way to create a crew.

Constraints

Subtask	Points	N	P	Q
1	5	$N = 3$	$P = 2$	$Q = 1$
2	10	$N = 9$	$P = 3$	$Q = 5$
3	10	$N = 81$	$P = 5$	$Q = 80$
4	50	$N = 19\,683$	$P = 8$	$Q = 24$
5	25	$N = 59\,049$	$P = 10$	$Q = 18$

Important Note: Up to 3 seconds of the time limit could be used up by the generator.

Input Specification

The first line of input will contain three integers N , P , and Q .

Output Specification

To answer this problem, print `C a b ...`. The P people in the crew will be numbered a, b, \dots . If there is no solution, print `C -1`. Afterwards, your program must terminate.

Interaction

This is an interactive problem. After reading the first line of input, your program can make queries.

A query is in the form `A x`, where $1 \leq x \leq N$. After printing `A x` and flushing (see Note 1), a string of length N will appear as input. This string consists of `1`'s and `0`'s. If the i^{th} character is `1`, then person x and person i know each other. If the i^{th} character is `0`, then person x and person i don't know each other. The x^{th} character is guaranteed to be a `1`.

You must not make more than Q queries (see Constraints for the exact number).

After your program is done making queries, your program can print an answer. If there are P **distinct** people, numbered a, b, \dots , who satisfy the conditions, then your program is allowed to print `C a b ...` as the answer. If there is no solution, print `C -1` instead. Afterwards, make sure you flush and terminate your program.

Note 1: To flush, you can use `fflush(stdout);` in C++, or `System.out.flush();` in Java, or `import sys; sys.stdout.flush()` in Python 2/3. For other languages, search in its documentation.

Note 2: An answer does not count as a query.

Note 3: In some test cases, the behaviour of the interactor is **adaptive**. This means that in these test cases, the interactor does not have a fixed response for each person. Instead, the responses given by the interactor may depend on the queries made by your solution. It is guaranteed that the interactor responds in such a way that after each response, there is at least one state consistent with all the responses given so far.

Sample Interaction

`>>>` denotes your output; don't actually print this out.

```
9 3 5
>>> A 1
100100100
>>> A 2
010010010
>>> C 1 2 3
```

All pairs of people in the crew don't know each other. In total, 2 queries are used.