

Check number

Enter a integer then check whether it is positive or negative.

Input

The first line of the input consist of a single integer number t which determines the number of tests.

In each of next t lines there is a single integer n .

Constraints

- $0 < t \leq 1\,000$
- $-1\,000\,000 \leq n \leq 1\,000\,000$

Output

For each number n print out the result in format "<n> is positive integer" or "<n> is negative integer" or "n is zero".

Separate your answers with a new line character.

Example

Input:

5
-7
9
0
4
-3

Output:

-7 is negative number
9 is positive number
n is zero
4 is positive number
-3 is negative number