

An evil professor has just assigned you the following problem.

A sequence is defined by the following recurrence:

$$x_0 = 1$$

$$x_i = x_{[i-\sqrt{i}]} + x_{\lfloor \ln(i) \rfloor} + x_{\lfloor i \sin^2(i) \rfloor}$$

Determine  $x_{1000000}$ .

## Input

Input consists of a number of lines, each containing one integer, a value of  $i$ , no less than zero and no greater than one million. Input is followed by a single line containing the integer '-1'. This last line is not a value of  $i$  and should not be processed.

## Output

For each value of  $i$  in the input (but not the final '-1'), output the corresponding value of  $x_i$  modulo 1000000.

## Sample Input

0  
-1

## Sample Output

1

