

SPOJ Problem Set (main)

3713. Primitive Root

Problem code: PROOT

In the field of Cryptography, prime numbers play an important role. We are interested in a scheme called "Diffie-Hellman" key exchange which allows two communicating parties to exchange a secret key. This method requires a prime number p and r which is a primitive root of p to be publicly known. For a prime number p , r is a primitive root if and only if its exponents $r, r^2, r^3, \dots, r^{p-1}$ are distinct (mod p).

Cryptography Experts Group (CEG) is trying to develop such a system. They want to have a list of prime numbers and their primitive roots. You are going to write a program to help them. Given a prime number p and another integer $r < p$, you need to tell whether r is a primitive root of p .

Input

There will be multiple test cases. Each test case starts with two integers p ($p < 2^{31}$) and n ($1 \leq n \leq 100$) separated by a space on a single line. p is the prime number we want to use and n is the number of candidates we need to check. Then n lines follow each containing a single integer to check. An empty line follows each test case and the end of test cases is indicated by $p=0$ and $n=0$ and it should not be processed. The number of test cases is at most 60.

Output

For each test case print "YES" (quotes for clarity) if r is a primitive root of p and "NO" (again quotes for clarity) otherwise.

Example

Input :

```
5 2
3
4
```

```
7 2
3
4
```

```
0 0
```

Output :

```
YES
NO
YES
NO
```

Explanation

In the first test case 3^1 , 3^2 , 3^3 and 3^4 are respectively 3, 4, 2 and 1 (mod 5). So, 3 is a primitive root of 5.

4^1 , 4^2 , 4^3 and 4^4 are respectively 4, 1, 4 and 1 respectively. So, 4 is not a primitive root of 5.

Added by: u.swarnaprakash

Date: 2009-01-14

Time limit: 3s

Source limit:50000B

Languages: All

Resource: Kurukshetra 09 OPC