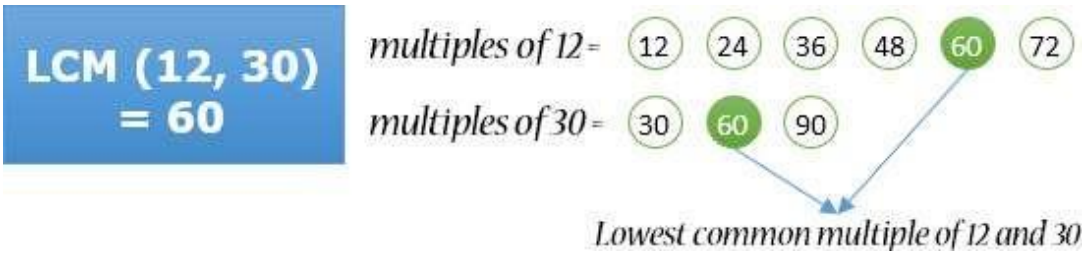
Lab 3

Loops

1. Program to display all the prime numbers within a range.
2. Input an integer and find the sum of the numbers at even positions and product of the numbers at odd positions. [Hint: N=1234. ,1234%10 is 4, 1234/10 is 123]
3. Input a number and check if the number is palindrome. (Hint: A number is palindrome if the number equal to reverse of the number. Find the reverse of a given number with the following hints: N=1234. ,1234%10 is 4, 1234/10 is 123. 4321 can be obtained by adding 4320+1 in the last iteration)
4. Produce FIBONACCI series 0,1,1,2,3,5,8,… . Read a limit n from the user which is the number of elements in the series.{Hint: Each element of the series is obtained by adding the current term and previous term- 1=0+1,2+1=3,2+3=5….etc]
5. Find out the highest common factor (H.C.F) or greatest common divisor (G.C.D) of two numbers .[Hint: The highest common factor (H.C.F) or greatest common divisor (G.C.D) of two numbers is the largest positive integer that perfectly divides the two given numbers. For example, the H.C.F of 12 and 14 is 2.]
6. Write a program which prints all perfect numbers in a given interval (Start,End)
   Implement the functions:
   [Hint:Perfect number is a positive integer which is equal to the sum of its proper positive divisors. For example: 6 is the first perfect number Proper divisors of 6 are 1, 2, 3. Sum of its proper divisors = 1 + 2 + 3 = 6. Hence 6 is a perfect number.]
7. Produce the following sequence and print the sum of the sequence $x^2+x^4+\ldots+x^n$, where the exponents need to be even number. If the n entered by the user is odd, give a message and read again a new value for n.
8. Write a program to swap the first and last digit of a number.
   [Hint: Suppose num= 12345 lastDigit = 12345 % 10 => 5
   digits = (No:of digits of num) -1 = 4
   firstDigit = 12345 / pow (10, 4) => 12345 / 10000 => 1]

9. Given two numbers find the Least Common Multiple(LCM) of those numbers



10. Write C programs to print the following patterns.

```
*
**
***
****
*****
```
a

```
    *
   **
  ***
 ****
*****
```
b

```
    *
   ***
  *****
 *******
*********
```
c

```
*********
 *******
  *****
   ***
    *
```
d

```
11111
22222
33333
44444
55555
```
a

```
12345
23456
34567
45678
56789
```
b

```
1
22
333
4444
55555
```
c

```
1
12
123
1234
12345
```
d

```
12345
1234
123
12
1
```

11. Cloning Toys (922A)

https://codeforces.com/problemset/problem/922/A

Imp likes his plush toy a lot.

Recently, he found a machine that can clone plush toys. Imp knows that if he applies the machine to an original toy, he additionally gets one more original toy and one copy, and if he applies the machine to a copied toy, he gets two additional copies.

Initially, Imp has only one original toy. He wants to know if it is possible to use machine to get exactly *x* **copied** toys and *y* **original** toys? He can't throw toys away, and he can't apply the machine to a copy if he doesn't currently have any copies.

Input

The only line contains two integers x and y ($0 \le x, y \le 10^9$) — the number of copies and the number of original toys Imp wants to get (including the initial one).

Output

Print "Yes", if the desired configuration is possible, and "No" otherwise. You can print each letter in arbitrary case (upper or lower).

Examples

input

```
6 3
```

```
Yes
```

input

```
4 2
```

output

```
No
```

Input

Copy

```
1000 1001
```

output

```
Yes
```

Note

In the first example, Imp has to apply the machine twice to original toys and then twice to copies.

Factorise N+M

Hari has a prime number n. Find a prime number m such that n+m is not prime.
A prime number is a number with exactly 2 factors. The first few prime numbers are 2,3,5,7,11,13,…
In particular, 1 is not a prime number.

Input

Each test contains multiple test cases. The first line contains an integer t ($1 \le t \le 10^4$) — the number of test cases. The following lines contain the description of each test case.

Output

For each test case, output a line containing a prime number m ($2 \le m \le 10^5$) such that n+m is not prime. It can be proven that under the constraints of the problem, such mm always exists.
If there are multiple solutions, you can output any of them.

Example

Input

3

7
2
75619

Output

2
7
47837

Note

In the first test case, m=2, which is prime, and n+m=7+2=9, which is not prime.
In the second test case, m=7, which is prime, and n+m=2+7=9 which is not prime.
In the third test case, m=47837, which is prime, and n+m=75619+47837=123456 which is not prime.