

Power of Two

Given an integer, write a function to determine if it is a power of two.

Input

First line contains an integer n indicating the number of test cases to follow. Each test case will be an integer.

Output

The boolean value of whether a number is a power of two.

Example

Input:

```
4  
1  
9  
8  
10
```

Output:

```
true  
false  
true  
false
```