

231. Power of Two

Easy



5.9K



375



Companies

Given an integer n , return `true` if it is a power of two. Otherwise, return `false`.

An integer n is a power of two, if there exists an integer x such that $n == 2^x$.

Example 1:

Input: $n = 1$

Output: `true`

Explanation: $2^0 = 1$

Example 2:

Input: $n = 16$

Output: `true`

Explanation: $2^4 = 16$

Example 3:

Input: $n = 3$

Output: `false`

Constraints:

- $-2^{31} \leq n \leq 2^{31} - 1$

Follow up: Could you solve it without loops/recursion?

Accepted 979.5K

Submissions 2.1M

Acceptance Rate 46.3%

Bit manipulation can be solved only by

Bit manipulations can be solved only by observations.

let $n = 16$

$n-1 = 15$

$$\begin{array}{r} 10000 \\ \& 01111 \\ \hline 00000 \end{array}$$

let $n = 8$

$n-1 = 7$

$$\begin{array}{r} 1000 \\ \& 0111 \\ \hline 0000 \end{array}$$

let $n = 32$

$n-1 = 31$

$$\begin{array}{r} 100000 \\ \& 011111 \\ \hline 000000 \end{array}$$

As we can see if any power of two is ANDed with its previous adjacent number the value comes out to be zero.

So

if $((n \& (n-1)) == 0)$
then n is power of 2.

$$T(n) = O(1)$$