



IEEEXtreme 10.0 > Flower Games

## **Flower Games**

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Intended complexity O(log N) per test, total complexity O(T log N)

## Solution:

One key observation is that if N is a power of 2, ie N =  $2^k$  the answer will always be 1. This can be easily proven: at the first cycle, you will remove all the even numbers, the you can relabel the remaining odd petals with numbers from 1 to N / 2. As the last removed petal is N, the next petal will be 1, so you are in the same case as when you started, but now you will only have N / 2 petals. Another observation is that if N =  $(2^k) + 1$ , the answer is 3, if N =  $(2^k) + 2$ , the answer is 5... until N =  $2^k$  when the answer is again 1 and so on. The answer for an arbitrary N is this: find the biggest K with  $2^k = N$ , the answer is  $1 + 2^k$  (N -  $2^k$ ).

There is also another alternate solution with recursion:

Answer(N) = 1 if N = 1

Answer(N) = 2 \* Answer(N/2) + 1 if N is odd

Answer(N) = 2 \* Answer(N / 2) - 1 if N is even

**Statistics** 

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