PROGRAMMING PUZZLES

Peace Umolu

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1. (7 - 19) April 2019

1.1. Arya and the Greet War (Easy, Bit Magic)

The whitewalkers are here and the Great War is on. Each and every living being is giving their best to save the world from the dead. Arya fighting with full dedication found that whitewalkers need to be killed with a pattern or else they wont die. So that she can fight till the end of the war. She tried to understand the pattern. She kills every $'Xth'$ whitewalker by stabbing them $'N'$ times .

Whitewalker approaching order (x)	1	2	3	...	55	...	98	...	101	...	198
Number of time-stabbing (n)	1	1	2	...	5	...	3	...	4	...	4

This is the hint of the pattern that Arya needs to follow. Help Arya!

Input: The first line of the input contains an integer T, denoting the number of test cases. The description of each testcase follows. Each test case contains a single line with one integer 'X' the Xth whitewalker .

Output: For each test case in, a new line print the number of stabs required to kill the 'Xth' whitewalker.

Constraints: $1 \leq T \leq 200, 1 \leq X \leq 200$

Example: $Input\ (4, 102, 95, 72, 60) \implies Output\ (4, 6, 2, 4)$

Explanation: Testcase 1: The number of set bits in the given number will be the number of stabs required to kill that whitewalker.

Reference `https://practice.geeksforgeeks.org/problems/arya-and-the-great-war/0`

1.2. Rightmost different bit

Given two numbers M and N. The task is to find the position of rightmost different bit in binary representation of numbers.

Input: The input line contains T, denoting the number of testcases. Each testcase follows. First line of each testcase contains two space separated integers M and N.

Output: For each testcase in new line, print the position of rightmost different bit in binary representation of numbers. If both M and N are same then print -1 in this case.

Constraints: $1 \leq T \leq 100, 1 \leq M \leq 10^3, 1 \leq N \leq 10^3$

Example: Input $(2, (11, 9), (52, 4)) \implies$ Output $(2, 5)$

Explanation: Tescase 1: Binary representaion of the given numbers are: 1011 and 1001, 2nd bit from right is different.

Reference `https://practice.geeksforgeeks.org/problems/arya-and-the-great-war/0`