Recitation - 06

March 2023

Problem [1]

There are n bulbs that are initially off. You first turn on all the bulbs, then you turn off every second bulb. On the third round, you toggle every third bulb (turning on if it's off or turning off if it's on). For the i^{th} round, you toggle every i bulb. For the n^{th} round, you only toggle the last bulb. Find the number of bulbs that are on after n rounds.

Figure 1: Example : $n = 3$

Solution

The square numbers will have odd number of factors. Hence, all the bulbs marked with square numbers will be on after n toggles. Answer - $\lfloor \sqrt{n} \rfloor$

[1] Problem credits - https://leetcode.com/problems/bulb-switcher/