Programming assignment 2.

Due date: Thursday, February 27 2020 at 11:59pm

In this assignment, we will apply the idea of divide and conquer algorithms (similar to binary search) to solve the below questions.

Note: The running time of your solutions should be ***O(logn)***.

Question 1. **Implementing** the square root function: Write a function that asks a user to enter an integer *N* and returns $\lceil \sqrt{N} \rceil$.

Example 1: input: 28
Output: 6

Example 2: input: 16
Output: 4

(**Note**:

- You are **NOT** allowed to use the built-in sqrt function in your code
- Do **NOT** use any type of array in your code)

Question 2. Given a *sorted* array of *n* ***distinct*** numbers where the range of the numbers are between 0 to m and **m > n** (m is given by user). Find the smallest missing number.

Example 1: input: a = [0, 1, 3, 6, 8, 9], m = 10
Output: 2

Example 2: input: a = [2, 5, 7, 11], m = 15
Output: 0

Example 3: input: a = [0, 1, 2, 3, 4], m = 8
Output: 5

Example 4: input: a = [12], m = 13
Output: 0