Extra Credit 1.

Question 1. Given *two sorted* arrays each of size *n*. Find the median of an array resulting from merging the two arrays. (Hint: You could use the same approach of binary search algorithm. The time complexity of your solution should be ***O(logn)***.)

Example 1:
a1 = [0, 2, 10, 26, 68], >> median = 10
a2 = [1, 11, 18, 20, 41], >> median = 18
Output: Median = (11+18)/2 = 14.5

Example 2:
a1 = [5, 6, 14, 26], >> median = (6+14)/2 = 10
a2 = [3, 41, 88, 100] >> median = (41+88)/2 = 64.5
Output: Median = (14+26)/2 = 20

Example 3:
a1 = [5, 10],
a2 = [2, 41]
Output: Median = **{max(a1[0], a2[0]) + min(a1[1], a2[1])}/2** = {max(5,2)+min(10,41)}/2 = {5+10}/2 = 7.5

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. (Hint: You could use the same approach of binary search algorithm. The time complexity of your solution should be ***O(logn)***.)

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

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

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

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