CSE220: Data Structures (Lab)
Fall 2024
Lab Quiz - 06
Duration: 30 Minutes

B

Name:	ID:	Section:

Question 1 [15 Points]

You are given several magical jars, each filled with a certain amount of liquid, represented by a min-heap. In each operation, the smallest non-zero liquid level, denoted by x, is extracted, and the liquid level in each non-empty jar is divided by x (using floor division). When a jar's liquid level becomes 0, it is considered empty. Your task is to determine the minimum number of operations required to completely empty all the jars.

You just need to write the extract_min(), sink(), and the minimum_operation_find() methods/functions.

Sample Input:	**Sample Output:**
heap = [2, 3, 5, 20, 100]	5

Explanation			
Heap Array	Heap Visual	Heap Array	Heap Visual
Initial Stage: [2, 3, 5, 20, 100]	**2** / \ **3 5** / \ **20 100**	**Step 3:** **Extracted the minimum value 2.** [10, 50, 0, 0, 0] **Performed floor division by the minimum value 2.** [5, 25 0, 0, 0]	**5** / \ **25 0** / \ **0 0**
Step 1: **Extracted the minimum value 2** [3, 5, 20, 100, 0] **Performed floor division by the minimum value 2.** [1, 2, 10, 50, 0]	**1** / \ **2 10** / \ **50 0**	**Step 4:** **Extracted the minimum value 5.** **Performed floor division by the minimum value 5.** [5, 0, 0, 0, 0]	**5** / \ **0 0** / \ **0 0**
Step 2: **Extracted the minimum value 1** [2, 10, 50, 0, 0] **Performed floor division by the minimum value 1.** [2, 10, 50, 0, 0]	**2** / \ **10 50** / \ **0 0**	**Step 5:** **Extracted the minimum value 5** [0, 0, 0, 0, 0]	**0** / \ **0 0** / \ **0 0**