CS 146, Data Structures and Algorithms, Section 2 & 3, Fall 2025
San Jose State University
Assignment 6-Non programming, 12 points

Deadline: Saturday, September 27, 8 A.M

1- [5 point] Select the correct response. Explain your solution.

a. $2^n = \Omega(n^{128})$

True False

b. 100n logn = Ω(n√n)

True False

c. Consider sorting an array of n elements using a comparison-based sorting algorithm and decision tree. The path from the root to every leaf node in the tree must have $\Omega(n\ log\ n)$ edges.

True False

2- [4 point] Answer the following questions:

a. Insert the following sequence of numbers into a min heap, then draw the heap as a tree and write as an array: [10, 7, 15, 17, 12, 20, 6, 32]

b. Insert the same values as above into a max heap, then draw the heap as a tree and write as an array.

3- [3 point] Answer the following questions:

a. Is Counting Sort is an in-place sorting algorithm (no extra space needed)? Please explain your answer.
b. Is this statement correct? Explain your answer: In a max heap, the right child is always greater than the left child.
c. When does the worst-case running time for Bucket Sort occur?