CSE 101
Winter 2021
Quiz 5 **Solutions**

1. (20 Points) Perform BuildHeap(A) on the following unordered array, making it into a max-heap. (The heap algorithms can be found here.) Observe that identical keys are accompanied by letters representing different satellite data. Thus the elements 2a and 2b have the same key, but are distinguishable elements in the max-heap.

A	2a	4	7	1a	2b	3	1b	5a	2c	6	8	5b

Show the state of array A after the call to BuildHeap(A).

Solution:

A	8	6	7	5a	4	5b	1b	1a	2c	2a	2b	3

2. (30 Points) Trace HeapSort(A) on the following array. (The heap algorithms can be found here.) Show the state of the array after the call to BuildHeap(A), and after each call to Heapify(A, 1). For each state of the array, also draw a vertical bar showing the boundary between the heap and the part of the array not in the heap.

A	4	2	6	3	1	5

Solution:

A	6	3	5	2	1	4

A	5	3	4	2	1	6

A	4	3	1	2	5	6

A	3	2	1	4	5	6

A	2	1	3	4	5	6

A	1	2	3	4	5	6