

Quiz 9

Data Structures — Recitation

Name: _____

NetID: _____

1. (4 points) Write a method `public Map<Integer, Integer> numLessThan(int[] arr)` that returns a map such that `numLessThan(arr).get(key)` returns the number of elements smaller than `key` in `arr`. `numLessThan(arr)` should only have entries whose keys appear in `arr`.
2. (4 points) Use the output of `numLessThan(arr)` to sort `arr`. *Hint:* Use bucket sort.
3. (2 points) Assume `numLessThan(arr).get` runs in $O(1)$ time. Without making assumptions about the elements in `arr`, what is the best worst-case asymptotic computational complexity of `numLessThan(arr)` if `arr` has n elements?