

HW10

Total: 20pts

Due 11:00PM Thursday Dec 4th in class via turnin. Submit either the softcopy or the scanned file to turnin.

1. (4pts) Illustrate the execution of merge sort step-by-step (algorithm on pages 694-695 in the textbook) on the array of 45, 67, 12, 34, 25, 39, 98. For each recursion, mark the values of leftFirst, leftLast, rightFirst, rightLast, and show the items in arrays values and tempArray.
2. (4pt) Illustrate the execution of quick sort step-by-step (algorithm on pages 700 and 702 in the textbook) on the array of 45, 67, 12, 34, 25, 39, 98. For each recursion, mark the values of first, last, and splitPoint, and show the swaps in method split() and the items in array values.
3. Consider an 11-entry hash table using the hash function, $h(i) = (2i + 5) \bmod 11$, to hash the keys 12, 44, 13, 88, 23, 94, 11, 39, 20, 16, and 5.
 - a. (3pts) Draw the resulting hash table, assuming collisions are handled by chaining.
 - b. (3pts) Draw the resulting hash table, assuming collisions are handled by linear probing.
 - c. (3pts) Draw the resulting hash table, assuming collisions are handled by quadratic probing, up to the point where the method fails.
4. (3pts) What is the worst-case time for putting n entries in an initially empty hash table, with collisions resolved by chaining? What is the best case?