1.
    a. O(NlogN)
    b. O(NlogN)
    c. O(NlogN)
2.
    a. O(NlogN)
    b. In lines 19 and 20 of the main quicksort routine in the textbook, the while loops need to be changed to
        i. while (a[++i] <= pivot && i < j)
        ii. while (pivot <= a[--j] && j > i)
        iii. Running time is O(N^2) when all the keys are equal
    c. In line 20 on the main quicksort routine the line needs to be changed to
        i. While (a[--j] >= pivot && j > i)
        ii. Running time is O(N^2) when all the keys are equal
3.

	a[0]	A[1]	A[2]	A[3]	A[4]	A[5]	A[6]	A[7]
Left, center, right	3	1	4	1	5	9	2	6
0, 1, 1	1	3	4	1	5	9	2	6
2, 3, 3	1	3	1	4	5	9	2	6
0, 2, 3	1	1	3	4	5	9	2	6
4, 5, 5	1	1	3	4	5	9	2	6
6, 7, 7	1	1	3	4	5	9	2	6
4, 6, 7	1	1	3	4	2	5	6	9
0, 4, 7	1	1	2	3	4	5	6	9

4.

Initial	Sorted by 1's	Sorted by 10's	Sorted by 100's	Sorted by 1000's
1693	1950	1612	2020	1072
1950	2020	2020	1072	1453
1612	1612	1950	1453	1612
2020	1072	1453	1612	1693
1072	1693	1072	1693	1950
1453	1453	1693	1950	2020