Assignment 1 - Report

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Part 2. Report

a) Asymptotic upper bound for the Quicksort for

Best case: O(nLogn)
T(n) = 2T(n/2) + O(n) is the recurrence equation for the best case.

Worst case: O(n^2).

T(n) = T(0) + T(n-1) + O(n) is the recurrence equation for the worst case.

Average case: O(nLogn)

$T(n) = T(n/9) + T(9n/10) + O(n)$ is the recurrence equation for the average case.

b)

c)

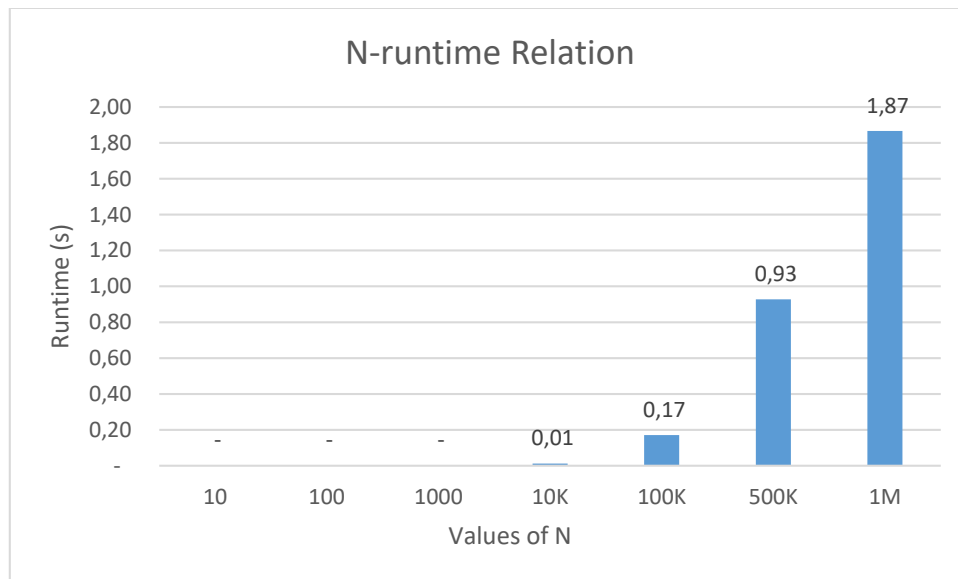|	10	100	1000	10K	100K	500K	1M
1	-	-	-	0,01	0,18	0,94	1,96
2	-	-	-	0,01	0,17	0,88	1,90
3	-	-	-	0,01	0,20	0,99	1,91
4	-	-	-	0,01	0,17	0,89	1,83
5	-	-	-	0,01	0,17	0,89	1,84
6	-	-	-	0,01	0,16	0,96	1,82
7	-	-	-	0,01	0,17	0,97	1,87
8	-	-	-	0,02	0,17	0,94	1,87
9	-	-	-	0,02	0,16	0,90	1,79
10	-	-	-	0,01	0,16	0,92	1,87
Average	-	-	-	0,01	0,17	0,93	1,87

Figure 1

Figure 2

The asymptotic bound I found in (a) is O(nlogn). There appears to be a linear and fast increase in the graph I found. Which indicates that, it has an O(nlogn) bounds. It similar to the graph in the Figure 3.
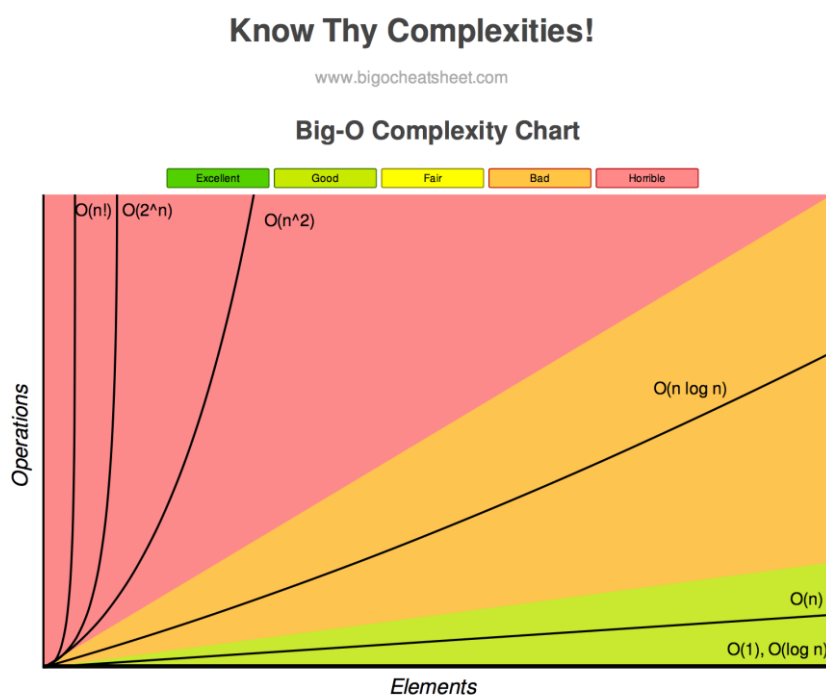

Figure 3: Lecture slides-Page:44

d) My code somehow is having difficulties when I want to run my code in an already sorted text file. It does the job for 10k but when I put 100k, it crushes. Because of this, I could not finish this part.