



Project Report

Project 1

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In this project we coded Linear Search Algorithm, Merge Algorithm and Insertion Sort Algorithms to see and analyze their running times. In this report I will explain the results of project and compare the running times.

Part A of Report

To find worst case running time of algorithm we used big-O notation and the results are in below.

Merge Sort	$\Theta(n \cdot \log_2 n)$
Linear Search	$\Theta(n)$
Insertion Sort	$\Theta(n^2)$

Part B of Report

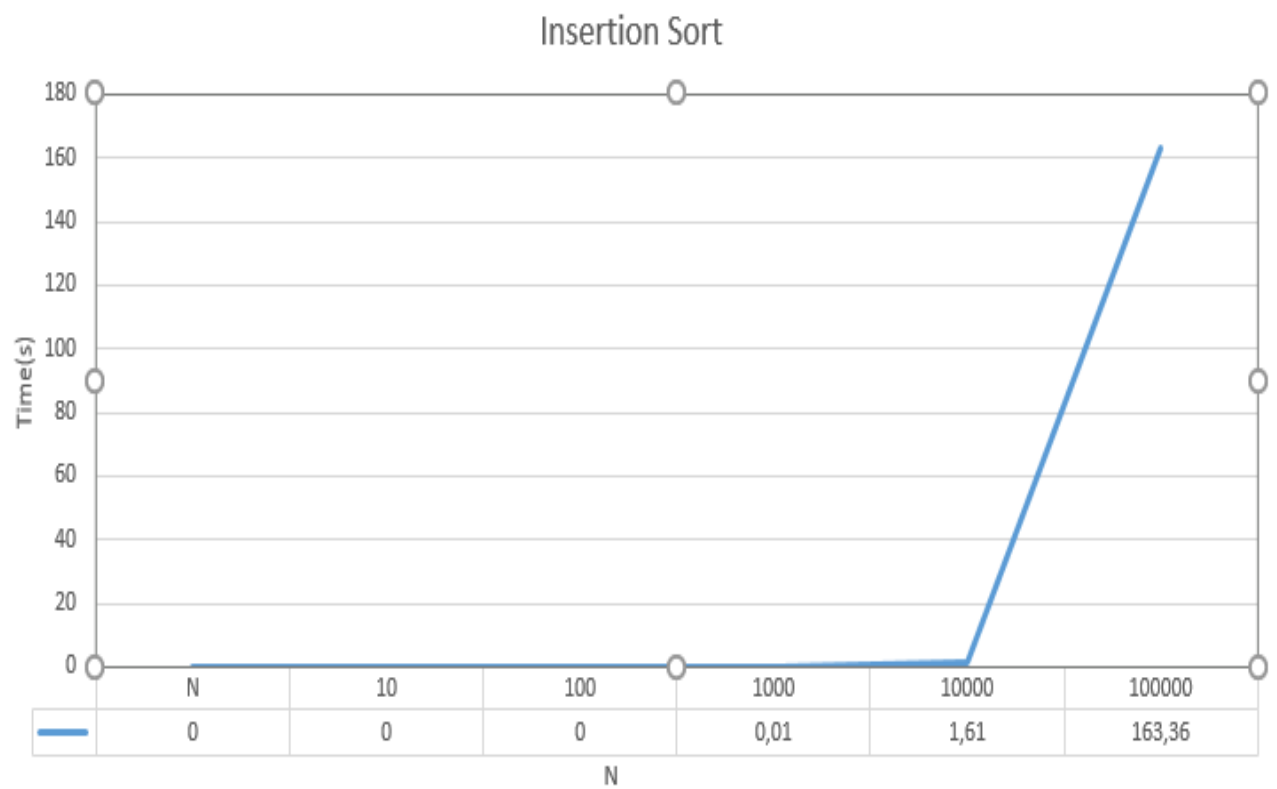
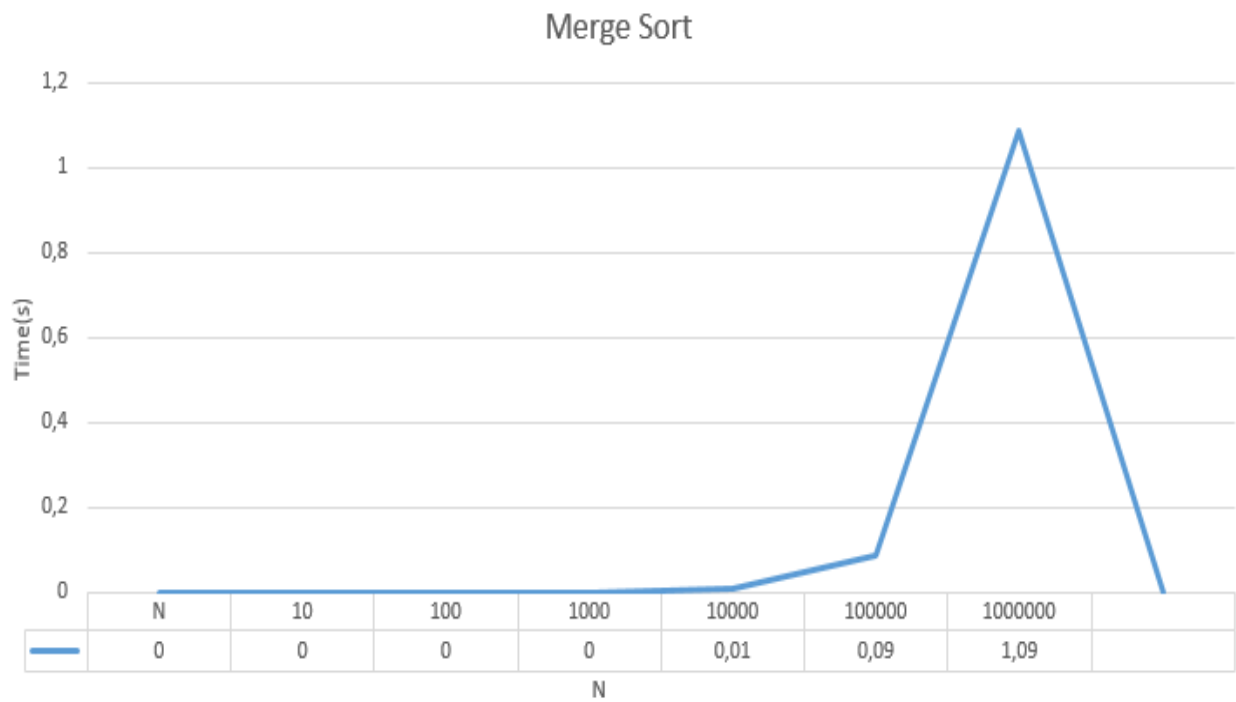
In this part we will see the calculated running times of algorithms. As you can see in the graph which is in below, there many difference between algorithms in terms of running times. I calculated the running times for N is equal to 10, 100, 1000, 10000, 100000 and 1000000.

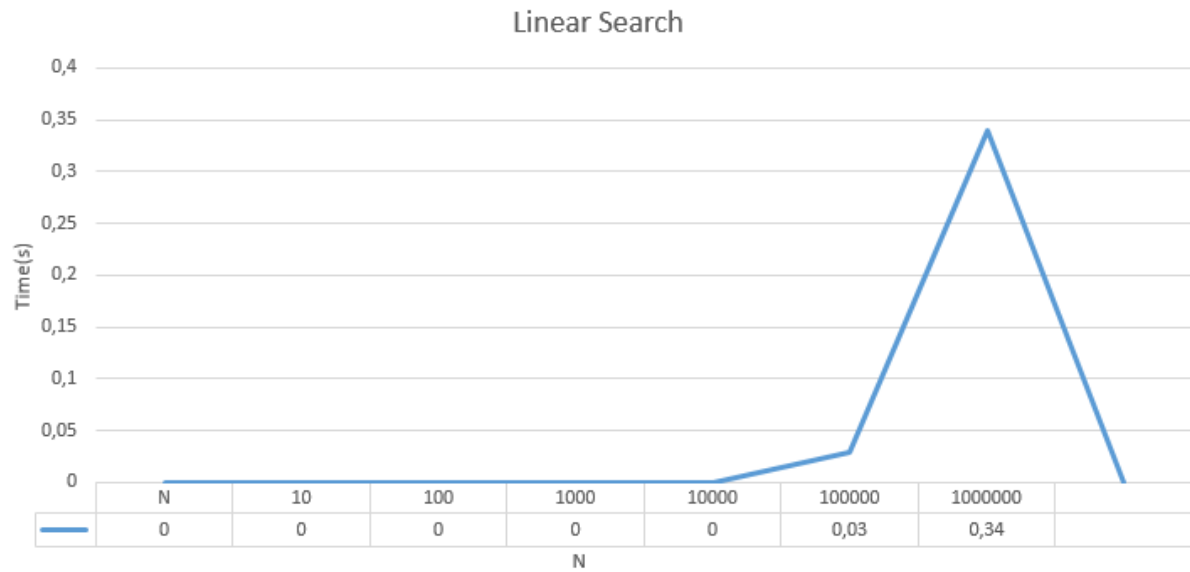
N	10	100	1000	10000	100000	1000000
Merge Sort (s)	0	0	0	0,01	0,09	1,09
Insertion Short(s)	0	0	0,01	1,61	163.36	Killed
Linear Search(s)	0	0	0	0	0,03	0,34

System of computer: intel core i5 5210u and 4GB DDR3

Part C of Report

The graphs which is created in excell program with finded values by using ctime library in the code, are below.





(decreasing lines in the graphs are about the excell program)

As you can see in graphs Linear Search algorithm is more usable for big datas. I showed in graph time values for N is equal to 10, 100, 1000, 10000, 100000 and 1000000. However program cannot calculated the result of Insertion Sort for 1 million. This calculating is concluded with killed error. Graphs show that the values between 10 and 100000 is not clear to see. However It is clear, for big datas I would choose Linear Search Algorithm.