CS 201

FUNDAMENTAL STRUCTURES OF COMPUTER SCIENCE I

SUMMER 2018

HOMEWORK ASSIGNMENT 2

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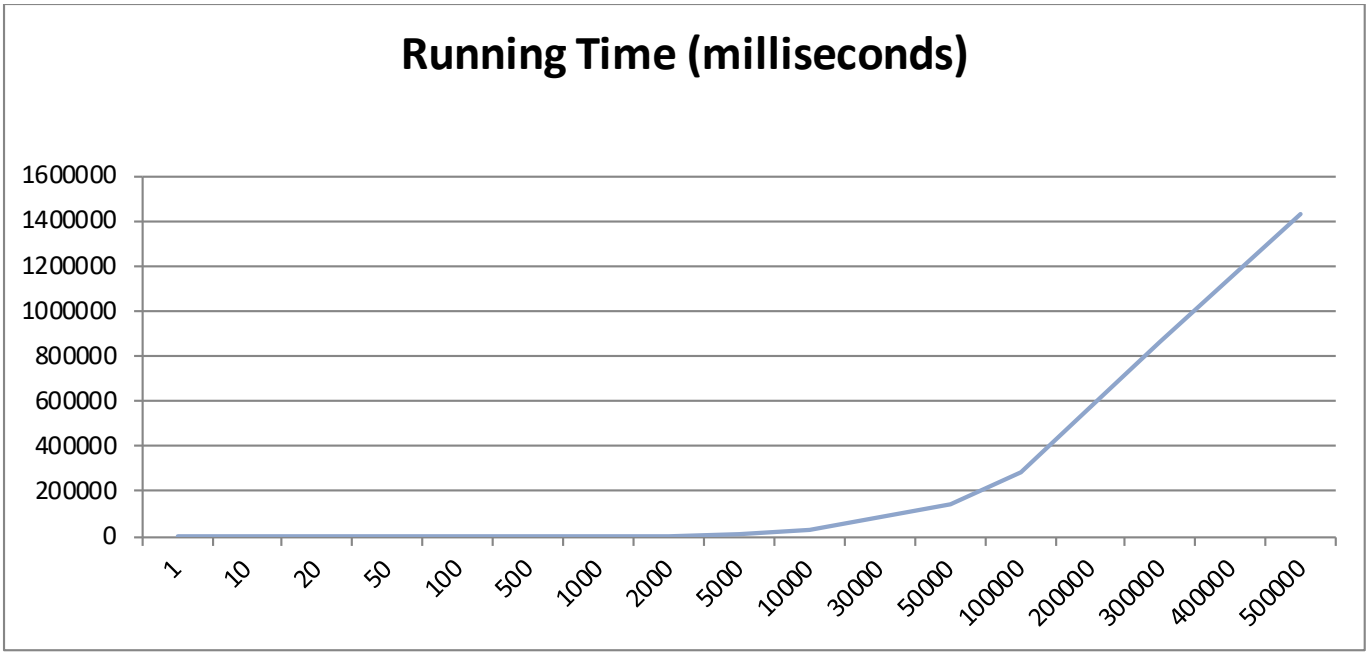
Table for Collected Data From Each Solution

(Size of output array is constant to 1000)

Number of Input	Running Time of Solution 1 (millisecons)	Running Time of Solution 2 (millisecons)	Running Time of Solution 3 (millisecons)
1	0	0	0
10	0	0	0
20	0	0	0
50	0	0	0
100	0	0	0
500	0	0	0
1000	1000	0	0
2000	4000	1000	0
5000	14000	1000	1000
10000	27000	2000	2000
30000	85000	7000	5000
50000	144000	12000	8000
100000	285000	28000	12000
200000	577000	48000	26000
300000	863000	78000	38000
400000	1143000	111000	52000
500000	1429000	151000	66000

Graph of Running Time for Solution 1 (milliseconds)

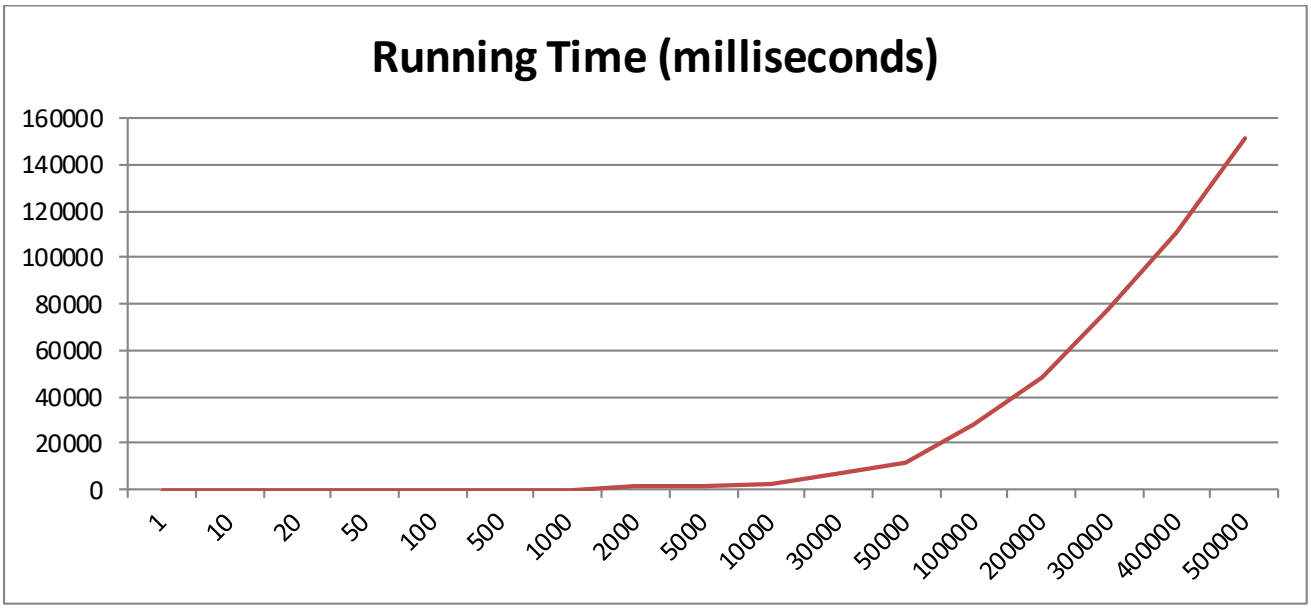
(Size of output array is constant to 1000)



Number of input (n)

Graph of Running Time for Solution 2 (milliseconds)

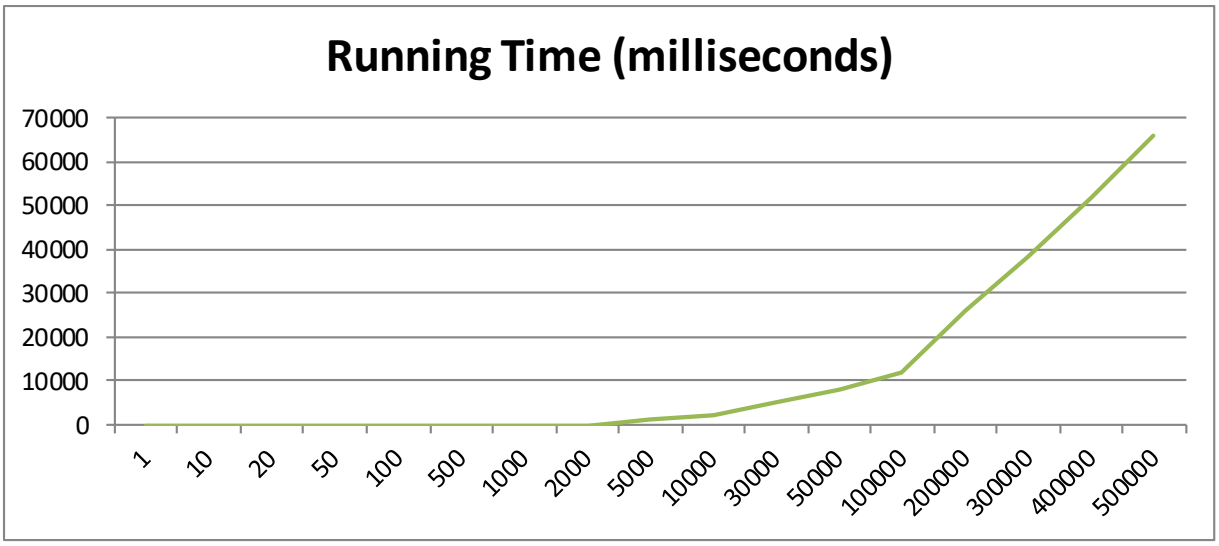
(Size of output array is constant to 1000)



Number of input (n)

Graph of Running Time for Solution 3 (milliseconds)

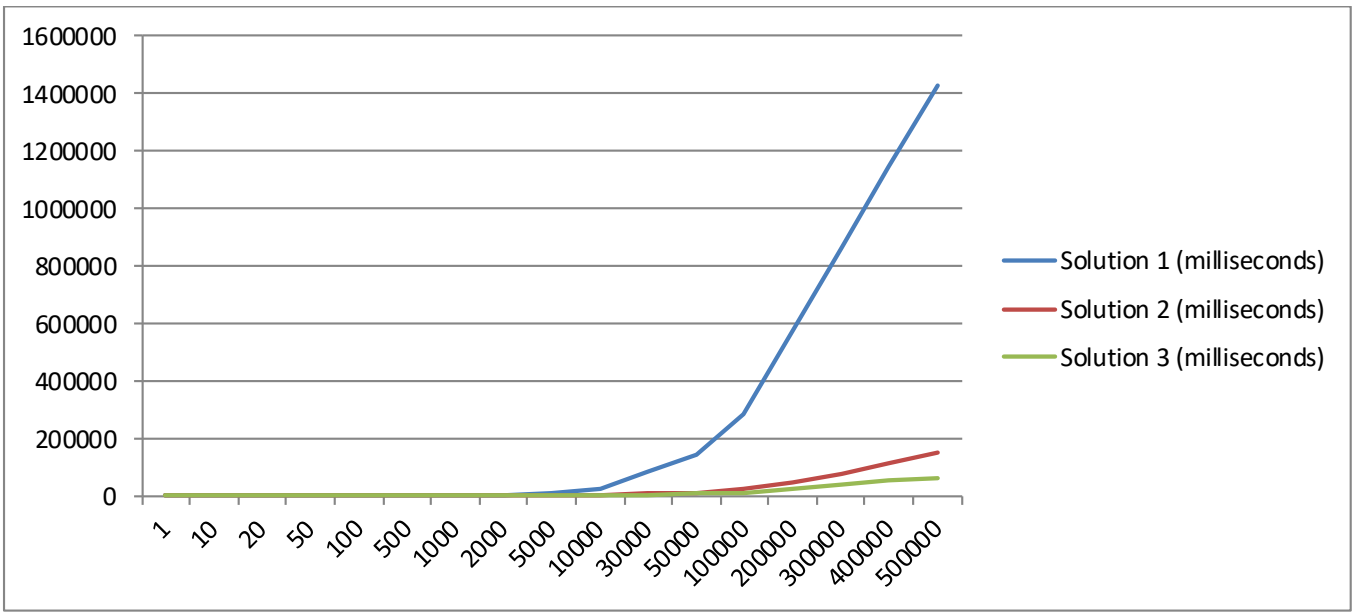
(Size of output array is constant to 1000)



Number of input (n)

Graph of Running Time for All Solutions (milliseconds)

(Size of output array is constant to 1000)



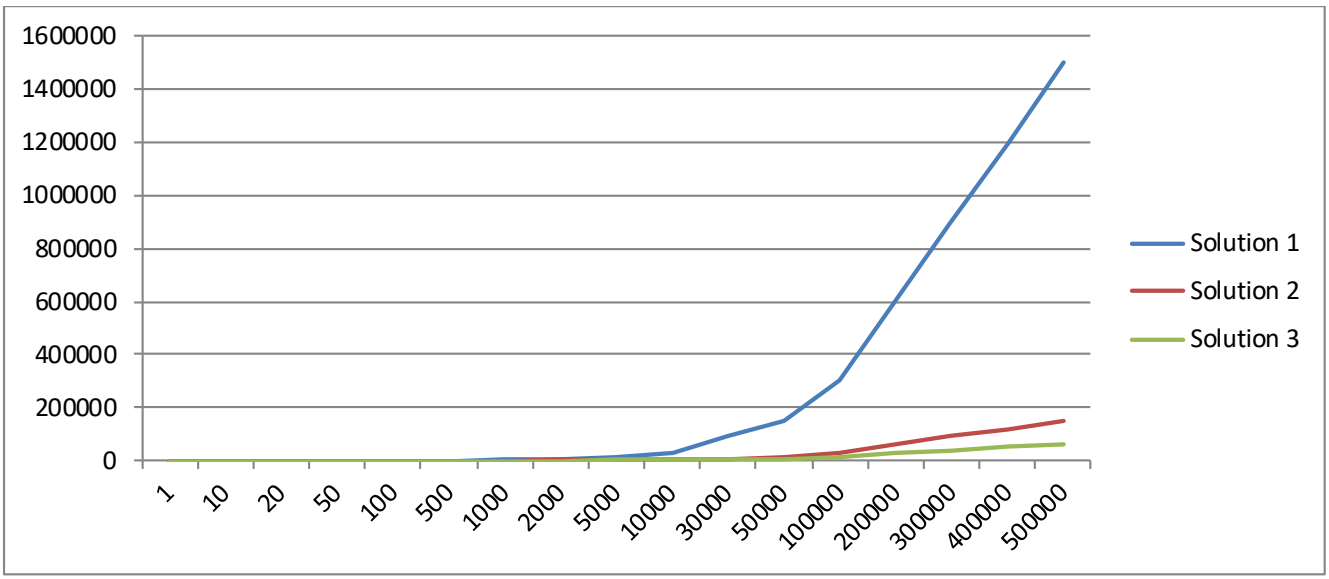
Number of input (n)

Specifications of the Computer

- Windows 10 Pro N
- Intel Core i5 – 2520M CPU @ 2.50 GHz
- 4,00 GB RAM (3,89 GB usable)
- 64-bit Operating System, x64 – based processor

Graph of Expected (Theoretical) Running Time for All Solutions (milliseconds)

- **(Size of output array is constant to 1000)**



Number of input (n)

Comparison and Evaluation of Expected Growth Rates and Obtained Result

In general, when we look and compare the graphs of expected growth and obtained results, it is understandable that the collected and calculated data from each solution acts in a similar trend. Both of the graphs prove that solution 3 is the most efficient, solution 2 is the mid efficient and solution 3 is the least efficient solution for the given problem. However, when we compare each data for given number of input one by one, there are differences between expected growth rate and obtained results in terms of running time in millisecons, whereas these differences are not changing the trend of the graphs. The theoretical data and the obtained data can include differences because of the practical applications. Obtained results can show differences from operating system to operating system or hardware to hardware. So it is normal to obtain different data from different computers. Another important point that

can effect the obtained data is, instant system usage of the computer while collecting the data from each solution. For example, while I was running the codes in main function, there were some applications and programs which were running on the system of my computer. All of these applications were effecting CPU and consuming RAM in some amount. If I would obtain the results while running different programs or without running any application, probably I would measure different running time for each solution, however the trend of the graphs would stay same.