

## CS-402 HOME-WORK:1

### Question:2

A)

Descriptions of the two systems that are used to execute the source code.

#### SYSTEM 1:

Manufacturer : Lenovo  
Processor : 11th Gen Intel(R) Core(TM) i5-1135G7 @ 2.40GHz 2.42 GHz  
Storage memory (RAM): 12.0 GB  
operating system : Windows 11  
  
System type : 64-bit operating system, x64-based processor  
  
Compiler used : Java compiler

LABEL	EXECUTION TIME IN SECONDS
1	6.1347903
2	4.2427789
3	4.1180006
4	4.282458
5	4.0951593
6	4.7481084
7	4.1776124
8	4.3090382
9	4.1522799
10	4.4135728

The Average Execution time for the above table is: **4.46737988 Seconds**

#### SYSTEM 2:

Manufacturer : Dell  
Processor : Intel(R) Core(TM) i7-7500 CPU @ 2.70GHz 2.90 GHz  
Storage memory (RAM): 8.00 GB  
operating system : Windows 10  
  
System type : 64-bit operating system, x64-based processor  
  
Compiler used : Java compiler

LABEL	EXECUTION TIME IN SECONDS
1	13.4918454
2	10.2935838
3	10.2102767
4	10.2511123
5	10.2242103
6	10.1701675
7	10.33691837
8	10.2440025
9	9.547968
10	10.2222124

The Average Execution time for the above table is: **10.5024563 Seconds**

#### **Performance ratio and more cost effective explained:**

- The performance ratio the same as the clock rate ratio of the two systems are not same.
- In general, a higher clock speed means a faster CPU. The clock speed measures the number of cycles your CPU executes per second, measured in GHz (gigahertz).
- We can conclude from the above observations that system1 is by 42% faster than system2.
- Coming to the retail price of the two systems. The price of the system1 is higher than the price of the system2.
- The retail price of the system1 is more cost effective then the retail price of system2 because, the performance of the system 1 is almost 42% higher than system2.

#### **B)**

- After changing the multiplication algorithm and repeating the steps, I used the naive multiplication algorithm with the column in the inner loop, then the same algorithm with the row in the inner loop, but I am getting an `ArrayIndexOutOfBoundsException`: as the rows in the inner loop are not possible.