**LAB 3: GROWTH OF FUNCTIONS**

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| **Instructor:** | Dr. Salama A. Mostafa |
| **Duration:** | 1 hour and 50 minutes |
| **Laboratory:** | Online |
| **Tools/Software:** | Lab computer, Word |
| **References:** | 1. Conte, S. D., & De Boor, C. (2017). Elementary numerical analysis: an algorithmic approach. Society for Industrial and Applied Mathematics. 2. Koren, I. (2018). Computer arithmetic algorithms. CRC Press. 3. Seaver, N., Vertesi, J., & Ribes, D. (2019). Knowing algorithms. In digitalSTS (pp. 412-422). Princeton University Press. 4. Puntambekar, A. A. (2020). Analysis and design of algorithms. Technical Publications. 5. Cormen, T. H., Leiserson, C. E., Rivest, R. L., & Stein, C. (2022). Introduction to algorithms. MIT press. |
| **Report** | 1. This task is done **individually.** 2. Send me the answer sheet to my email **Dr.Salama.Mostafa@gmail.com** 3. The email subject and file name have the following format **BIE20303-S4-LAB1-MatricNo-Name** |

Q1) Find the order of growth for the following functions:

1. 8+2x-3
2. +8x log x
3. log(+1)
4. x

Q2. Find the order of growth of the following using order of magnitude method.

a)

for (i = 0; i < n; i++)

a[i]=a[i]+b[i];

b)

for (i = 0; i < n; i++)

for (j = 0; j < n; j++)

a[i][j]=a[i][j]+b[i][j];

c)

for (i = 0; i < n; i++)

for (j = i+1; j < n; j++)

swap(a[i][j], a[j][i]);

d)

for (i = 0; i < n; i++)

for (j = 1; j <=3i; j++)

swap(a[i][j], a[j][i]);