Homework 1*

Data Structures
Fall 2019 CS203@IITG

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(1) Prove the transitivity, reflexivity, symmetry, and transpose symmetry relations of the asymptotic notation. (Refer to pages 51-52 of [CLRS].)

(2) Let $f(x) = a_n x^n + a_{n-1}x^{n-1} + \ldots + a_1 x + a_0$, where $a_0, a_1, \ldots, a_n$ are real numbers with $a_n \neq 0$. Then show that $f(x)$ is of order x^n.

(3) Write the pseudocode for summing the integers stored in a two-dimensional C array. The pseudocode is permitted to use the primitives supported by word-RAM model of computation only. Argue that the pseudocode is indeed an algorithm. Further, give the asymptotic worst-case tight bound of the time and the asymptotic worst-case tight bound of the space used by the algorithm.

— more problems will be added —

*Prepared by R. Inkulu, Department of Computer Science, IIT Guwahati, India. http://www.iitg.ac.in/rinkulu/