**Algorithms (CSCI 323 & 700)**

**Spring 2016 - Homework #5**

**(Due at the beginning of class on 3/9/2016)\***

1. Stirling’s approximation formula for factorials is n! ~ √(2πn) (n/e)n. Use it to find a better approximation of log(n!) than the “n log n” upper bound obtained in last week’s homework.
2. Use the Master Method to find the order of growth for T(n) = 8T(n/2) + n2.
3. Use the Master Method to find the order of growth for T(n) = 3T(n/3) + n3.
4. Assuming that n = 22^k, solve the recurrence T(1) = 1, T(n) = T(√n) + 1.
5. Using the methods of last class, solve the recurrence T(1) = 1, T(n) = 1 + 2∑k=0..n-1 [T(k) + T(n-k-1)].
6. Suppose you have n unordered integers from the range {0 … n2 – 1}. What sorting algorithm would you use to order the data as efficiently as possible? What would be its time complexity?

\* Only if you will not be able to attend class on the due date, submit your solutions - *before 6:00 p.m. on the due date* - to the instructor at LT.CS320@yahoo.com