Algorithm Analysis Homework 2

Problem 1~3: Due by 4/4(Thu.) in class

Problem 4: Due by 4/4(Thu.) midnight through HISNET

1. Write a recursive algorithm in pseudo-code to calculate $C(n,k)$, the number of k-combinations (i.e., k-element subsets) of an n-element set. Use the formulas

$$C(n,k) = C(n-1,\ k-1) + C(n-1,\ k)$$

valid for $1 \leq k \leq n-1$, and

$$C(n,\ n) = C(n,0) = 1$$

valid for $n \geq 0$.

2. Repeat problem 1. At this time write an algorithm with dynamic programming approach (in pseudo-code) instead of recursive one.

3. What is time complexity of algorithm in problem 2?

4. Realize algorithm designed in problem 1 and 2 with 'C'. Write your program in one and submit it in HISNET.
   It might be a good idea to compare the execution time of two algorithms for various inputs.
   ex) Try for the following n & k values

n	k
20	10
30	15
35	17
37	18
38	19
39	19
40	20