Algorithm Analysis Homework 3

Due by 4/10(Fri.) through HISNET

(a) Problem 1~2: Submit pdf file

(b) Problem 3: Submit source code

1. Write a recursive algorithm in pseudo-code to calculate $C(n,k)$ for $n >= k$, the number of k-combinations (i.e., k-element subsets) of an n-element set. Use the formulas
   1) $C(n,k) = C(n-1, k-1) + C(n-1, k)$ for $n > 0$ and $k > 0$
   2) $C(n,0) = 1$ for $n >= 0$
   3) $C(0,k) = 0$ for $k > 0$
   4) $C(n,n) = 1$

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

3. Realize algorithm designed in problem 1 and 2 with 'C'. Write your program in one file (i.e. main function prompts user to enter two integers (n and k) and calls two function – one for recursive solution and another for DP solution) and submit it in HISNET.
   For you own good, 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