Homework #2

Due date: 18: 00, October 17th, Monday, 2016

Problem statement

Given two integers $n, k, 20 \geq n \geq k \geq 0$, compute

$$c(n, k) = \frac{n!}{k!(n-k)!}$$

Which is the number of unordered selection of k out of n items.

Requirements

1. Write a C program that is capable of handling input.
2. See the sample run below for the required output format.
3. You may assume that the inputs are correct.
4. Properly comment your program.
5. Plagiarism is not allowed!

Submission

Be sure to upload your source code to E3 by the due date and compress your .c file as "**xxxxxxx_hw2.zip**", where **xxxxxxx** is your student ID.

Sample run

Enter n and k, n>=k>=0: 12 10
c(12,10) = 12!/(10!2!) = 479001600/(3628800*2) = 66

Enter n and k, n>=k>=0: 5 2
c(5,2) = 5!/(2!3!) = 120/(2*6) = 10

Enter n and k, n>=k>=0: 10 5
c(10,5) = 10!/(5!5!) = 3628800/(120*120) = 252

Enter n and k, n>=k>=0: 11 11

c(11,11) = 11!/(11!0!) = 39916800/(39916800*1) = 1
Enter n and k, n>=k>=0: 9 0
c(9,0) = 9!/(0!9!) = 362880/(1*362880) = 1

Enter n and k, n>=k>=0: ^Z

Part 2 (15%)

Given $c(n,k)$, besides printing the computation formula, also print all the values of $c(1,1)$ to $c(n,k)$ into a table with n rows and k columns.

For instance, given c(5,3), then you should print the value of:

c(1,1) c(1,2) c(1,3)
c(2,1) c(2,2) c(2,3)
c(3,1) c(3,2) c(3,3)
c(4,1) c(4,2) c(4,3)
c(5,1) c(5,2) c(5,3)

Note that the value of the red part doesn't exist, so print 0 instead.

(Finishing this part is not mandatory, you can do it if you have extra time)

Sample run

Enter n and k, n>=k>=0: 5 3
c(5,3) = 5!/(3!2!) = 120/(6*2) = 10
1 0 0
2 1 0
3 3 1
4 6 4
5 10 10