CSE 114 - Fundamentals of Computer Programming
Assignment 4
Due: 09.04.2021, 11:59 PM

In this assignment, you are going to implement a C program that computes the result of the following equation:

$$\sum_{i=1}^{n} \frac{\sum_{z=1}^{n-i} i^z}{\sum_{j=1}^{i} \frac{j^n \binom{n}{j}}{n!}}$$

Your program should ask the user for the input n, and print the result as a **double.** You must use **for loop** statements while calculating the result of the summations.

You must implement 3 functions that return factorial, power, and combination of any number. In factorial and power functions you must use **for loop** statements for the calculations.

`int factorial(int n); // denoted n!, is equal to 1*2*3*..*(n-1)*n (15 points)`

`int power(int x, int y) // denoted` x^y `(15 points)`

`int combination(int n, int r); // denoted` $\binom{n}{r}$`, is equal to` $\frac{n!}{r!*(n-r)!}$ `(15 points)`

In the main function:

- Ask the value n from the user to use it for the upper limit of the summation index. **(5 pts)**
- Use **for loops** when you make summation $(\sum)$. (**25 pts)**
- Call the functions in the correct order to produce outputs like the examples in below. You may need to call the functions more than once to produce the desired output. (**20 pts)**
- Print the result with the given format below examples for the given n**.** (**5 pts)**

Warning:

- **DO YOUR OWN WORK.**
- Submit only the source file in the format **assignment4_name_surname.c**
- **Be sure the extension of your file is c.** If you do not know how to check the extension please look at the file ("How to run your code?") on the Coadsys.
- Do **not** use any library other than stdio.

Example inputs/outputs: