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**Computer Science Department**

**COMP133 ( Spring 2020 )**

**Assign # 3 Due Date: Mon 20/4/2020 by 10:00 pm ( on Ritaj )**

***Notes:***

1. ***The assignment should be submitted by the due date and time ( Late Assignments will not be accepted for any reason ) on Ritaj.***
2. ***The assignments are individual effort and copying the assignment will be treated as a cheating attempt, which may lead to FAILING the course.***

Write a C program that reads a double value (***x***) from the user and then uses it to compute the value of the mathematical constant ***e*** to the power of ***x*** (***ex***) and print it in ***main*** using the following infinite series:

**ex = 1 + x/1! + x2/2! + x3/3! + x4/4! + …**

Your program should include ***the following three functions:***

1. function called ***powe***r which takes two parameters: ***x*** (double) and ***y*** (integer) and returns the value of ***xy*** . **Function *power* MUST use a *while* loop**. ( Not allowed to use the predefined function pow in math.h).
2. function called ***factorial*** which takes one parameter ***x*** (integer) and returns its factorial. **Function *factorial* MUST use a *for* loop**.
3. function called ***compute\_ex*** which receives one parameter ***x*** (double) and returns the value of **ex** for the given ***x*** using the series above as well as functions ***power*** and ***factorial*** ( 1 and 2 above) . **Function *computer\_ex* MUST use a *do/while* loop.** The loop should stopwhen the new term added ( ***term = Xn/n!*** where ***n=0,1,2,3,…***) to the series is less than 0.0001.

**Example of a Sample Run :**

Enter x

2.5

e to the power 2.50 = 12.18

***VERY IMPORTANT:***

1. Turn in your assignment by ***replying to the course coordinator’s message*** on Ritaj and attaching your code file (***main.c***).
2. ***DO NOT SEND a MESSAGE To YOUR INSTRUCTOR WITH YOUR ASSIGNMENT. DOING so will RESULT in RECEIVING a GRADE of ZERO for the assignment even if YOU TURN it in by the due date and time.***
3. You must include your full name, student id number, and ***lab section number*** in a comment at the beginning of your ***main.c*** code file.