Programming Fundamentals Lab

Lab 09 **Marks 100**

Instructions

Work on this lab individually. You can use your books, notes, handouts etc. but you are not allowed to borrow anything from your peer student.

Submission

No submission is required.

What you have to do

Program the following tasks in your Microsoft C++ compiler and then compile and execute them. The name of your files will be according to the task given in this lab.

Task 1 [10]

Write a function `printNumbers()` that will **print** out the numbers from 60 to 48 backwards all on one line with the help of only one variable. Print the messages "Starting" and "Done" before and after the line of numbers. Test the function from `main()`.

Sample output:
Starting
60 59 58 57 56 55 54 … … … 48
Done

Task 2 [10]

Write a function which takes a single integer parameter, and determines whether it's an even or an odd number.

Task 3 [20]

Write a function `"estimateCost(...)"` to gauge the **expected cost** of an item in a specified number of years. The program asks for the cost of the item, the number of years from now that the item will be purchased, the rate of inflation and make a call to `"estimateCost (...)"` which will **estimate** and **display** the cost of the item after the specified period. If user enters the inflation rate as a percentage like 5.6 (%), your program should then convert the percent to a fraction such as 0.056 and estimate the price adjusted for inflation. Test the functionality of your module from `main()`.

Inputs:

price today's price of the item

years number of years from now that the item will be purchased

inflation the rate of inflation (need to convert to decimal form)

Output:

price of the item in that many years

Task 4 [30]

Write a function that will print **Fibonacci series** up to *n* number, the *n* is entered by a user and passed to a function as an argument. By definition, the first two Fibonacci numbers are 0 and 1, and each remaining number is the sum of the previous two.

$F_n = F_{n-1} + F_{n-2}$

The Fibonacci series is 0, 1, 1,2,3,5, 8, 13, 21…

Task 5 [30]

In mathematics, the **factorial** of a positive integer n, denoted by n!, is the product of all positive integers less than or equal to n. For example, 5! = 1 x 2 x 3 x 4 x 5 = 120. 0! is a special case that is explicitly defined to be 1.

So write a function *"caluclateFactorial(int)"* that inputs a positive integer, **computes** and **display** its factorial. Your program should place a **proper check** if user entered a **negative number**. After each calculation, the program should ask the user either he/she wants to continue or not, the program should continue its execution unless user entered **-1**. Test the functionality of your module from *main()*.

☺ ☺ ☺ **BEST OF LUCK** ☺ ☺ ☺