CSC 1100 – Elements of Programming | ASSIGNMENT | Semester 1, 2019/2020

1. INSTRUCTIONS:

- This assignment can be done **individually or in pairs** as per the following rules:

TYPE	COMPULSORY	WEIGHTAGE	BONUS
Individual	Exercise 1 Exercise 2	9 Marks 6 Marks	Refer Below
Pair	Exercise 1 Exercise 2 Exercise 3	7 Marks 5 Marks 3 Marks	Refer Below

- A pair should consist of 2 students only.

- Pair programming is highly encouraged and carries a **bonus** of 2 Marks.

- For individual programming, Exercise 3 is a **bonus** and carries 2 Marks.

- Name, Matric number & Section of individual/pair members should be included in the comments of the program file/s, at the beginning.

- Submit your files by uploading them to the google classroom. For pairs, only 1 member should upload the assignment files.

- All files must be submitted as .cpp or .txt.

- This is an **exploratory assignment**. You are free to refer to any online/offline resources as long as you don't plagiarise and refer to your sources. Any form of plagiarism is highly unacceptable.

- **Assignment bears 15 Marks (15% of your Total Course Evaluation).**

2. IMPORTANT DATES

|	
SUBMISSION DEADLINE - *INDIVIDUAL*	03rd Dec, 2019, 02: 00 PM
SUBMISSION DEADLINE - *PAIR*	03rd Dec, 2019, 04: 00 PM

- Any individual/pair that submits before 02nd December 2019, 05:00 PM will be given a **bonus** of 3 Marks. The bonus will be given, if the assignment scores at least 7 Marks upon checking.

3. EXERCISES

Exercise 1: Ahmad started training 3 days before to participate in a longest swimming competition. This competition doesn't focus on the speed but on the longest time spent swimming. His coach keeps a record of the time intervals (whole minutes only), every time he takes a break, using a file. Each day's entries are recorded in one line. Ahmad ends his day when he has taken 4 breaks. They want to analyse the numbers in the preceding night to the competition. However, they need to re-arrange all the numbers in ascending order. Ahmad suggests to compare the adjacent elements only and re-order them wherever required. It is a tedious work for them and they decide to hire you to help them. Based on the given circumstances, you are required to write a program to help Ahmad so that he can do it faster using a computer program. Also, Ahmad would like to see the output of the program every time a reordering happens.

Exercise 2: Ahmad's swimming coach in the above example thinks that his way of re-arranging is inefficient. He thinks they should only be concerned on numbers on a daily basis. He suggests to choose any random number as a pivot and arrange smaller numbers on one side and larger ones on the other side. Ahmad and his coach would like to see the output every time an operation is performed on the numbers in the file.

Exercise 3: Fig 1. presents a number sorting technique. Observe and understand it's working. You are required to design an exam question for the same. The exam question shouldn't give explicit name of the sorting technique but conditions surrounding it so that the students can implement those conditions to sort the numbers in an array.
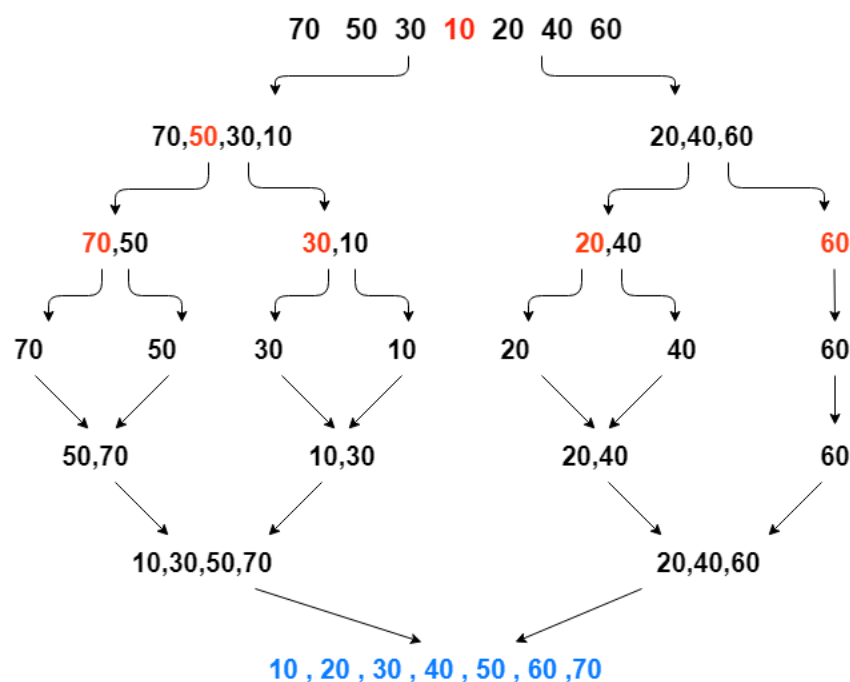
*** HINT: All the above exercises are based on famous sorting techniques.
END