Data Structures & Algorithms II– IS 2110

Second Year - Group Assignment 2

3 students per group

(Groups are given in a separate sheet)

Deadline : 25th January 2020

1) Suppose that you are given a one-dimensional array which contains both positive and negative integers. You are required to find the sum of contiguous subarray of elements which has the largest sum.

For example, if the given array is {-10, -13, 23**, -10, -11, 8, 13**, -17}, then the maximum subarray sum is 23 with the highlighted elements.

You are required to produce solutions using **naive method** and **Divide and Conquer** approach analyzing time complexities in each approach.

2) You are given an array of independent jobs where every job is associated with a deadline and profit. The profit could be claimed only if the job is finished before the deadline. It is also given that every job takes only a single unit of time and hence the minimum possible deadline for any job is 1. You are required to find out how to maximize total profit if only one job can be scheduled at a time.

Input: Seven Jobs with following deadlines and profits

JobID	Deadline	Profit
J1	2	90
J2	2	20
J3	1	40
J4	1	30
J5	4	65
J6	1	35
J7	3	50

Output: Following is maximum profit sequence of jobs
J3, J1, J7, J5

The Task

With respect to the questions given above, the followings should be submitted

- executable programs (using either Java or C++ languages) with the above functionality given under questions (i) and (ii) however, without any run time errors.

- a report (*not more than 5 pages*) along with test cases clearly illustrating important code segments of each algorithm.

Deadline: on or before 25th January 2020. The executable program files (with your program code) and the report should be submitted electronically to the LMS in one Zip file. **It is important that you use the group number to name the zip file**. The cover page should contain the index numbers and the email addresses of the group members. State the execution procedure of your executable files if a special procedure has to be followed to execute them. The marks will be allocated for the group as given below:

i. Programming solutions (you may use a language of your choice)

ii. A group report illustrating your approach and algorithms to the questions given above.

Plagiarism

All programming work must be your own. All forms of plagiarism and cheating (for example downloading programs directly from the internet or copying from another student) are regarded seriously and could result in heavy penalties including failure in the assignment.