CS1020E: DATA STRUCTURES AND ALGORITHMS I

Tutorial 11 – 

(Week 13, starting 7 November 2016)

1. *Longest Sub-Array*

You are given `arr` of integers, its size (which is very large), and a non-zero integer `sum`. **For each** index `rightIdx`, in increasing order, **print out** the pair containing the **leftmost** index `leftIdx` and that `rightIdx` of the longest consecutive sub-array arr[leftIdx..rightIdx], such that the sum of all numbers in arr[leftIdx..rightIdx] is equal to `sum`, provided such a left index exists.

```
void solve(int arr[], int size, int sum) { /* leftIdx rightIdx */ }
```

(a) Design and implement a **O(N^2)** algorithm, which is much better than the O(N^3) brute force algorithm

(b) The O(N^2) algorithm can be **optimized**. Design and implement an **O(N log N)** algorithm

(c) Now if the array only contains positive integers, implement an **O(N)** algorithm that does the job

2. *Next Problem*

Have you completed question 1(a) - (c)?

3. *VisuAlgo Online Quiz*

This semester, we will not do VisuAlgo Online Quiz formally as the PE2 setting is already too stressful. Therefore this part is currently optional. That is, not graded (0%).

However, Lab TA will instruct you to try the following exercise (20 minutes) as it is still very useful:

https://visualgo.net/training.html?diff=Hard&n=15&tl=20&module=list,recursion,sorting,hashtable

See how a machine (VisuAlgo) creates questions and auto grade them… instantly… :O.

TA will also spend some time discussing the solution of some random questions in VisuAlgo online quiz.