Assignment-3

CSE 373: Design and Analysis of Algorithms Section-2

Last date of submission- December 26, 2019

- Any similarity of the assignments will give you both (all) the copies a big zero. *Do not share your algorithm or code with anyone.*
- Any programming language is welcomed.
- You need to write the algorithm using pen and paper in your report and also need to give the screen shot of the programming assignment in your report along with the codes. Copy the codes from your workspace but give the screenshot of your results with the FULL window of your machine.
- Email me a day before you want to submit your assignment, I will give you time accordingly for the viva. If you are done with the assignment, consider submitting it soon, do not wait for the last submission day.
- Make sure it is your own, you have to face viva.
- No need to submit if you think you will not be able to implement this graph algorithm from the scratch in front of I.
- You may see/check the algorithm from book/slides I have given or web but before writing make sure that you understand line by line. You might be face different questions, even to implement it in front of us or different kind of viva questions regarding the algorithm used or implementation.
- Understanding each line before implementing is a MUST. Authenticity, integrity and honesty is a MUST.
- All these rules must be maintained. Thank you for always being so nice and honest student. I believe you will not disappoint us.

Assignment- 3

Suppose a startup delivery service has assigned you to build a program for them, which will be used to calculate the wages of the delivery men against the number of kilometers they visit for deliveries. In a certain area based on the number of customers to reach in each road, the program will help one delivery person to ride the minimum distance to visit and cover all the customers based on the road to road distance in kilometers. This will also help the start up to give the optimized amount of wages to a delivery person.

Part: Two

Input

The input consists of several test cases. The first line contains the number of test cases. For each test case, you will be given the integer number of customers c **(0 < c < 1024)** and the street numbers (also

integers) S1, S2, S3 …., Sn where the customers live (0 < Si < 30,000). **N.B.** several customers might live at the same street.

Output

For each test case, your program must write the minimal sum of distances from the entry position of the area to each of the customer's house. The distance between two street numbers Si and Sj can be calculated with

$d_{ij} = |S_i - S_j|$.

Sample Input
2
2 2 4
3 2 4 6
Sample Output
2
4
Part: Two

Based on the above scenario if the customers are labelled as A, B, C, and so on. What will be the best way for a delivery person so that he can make the fastest deliveries to all of the customers listed like blow:

A ----> B = 2 km

E ----> B = 3 km

C ---- >A = 4 km

F ----> E = 6 km

D ---- >A = 8 km

Deliverables:

You are required to write a program using any programming language of your own choice.

Submission Guidelines: You must submit all source code files and zip it in a folder named "XXXXXX_Assignment03.zip" format where "XXXXXX" is your NSU id.