Dept. of CSE, Bennett University

ECSE379L – Programming Using C++

Lab Assignment – 3

In this lab, you will write a C++ program to solve the following problem.

(1) Given two integers **r1** and **r2**, representing the radius of two circles (C1 & C2),
   a. First task is to find the area of both the circles (AC1, AC2).
   b. Second is to find the radius of a new circle (C3) whose area is = AC1 + AC2.

Sample Input: r1 = 4, r2 = 6
Sample Output: (a) AC1 = 50.265482457437, AC2 = 113.09733552923
(b)r3 = 7.2111025509353

(2) One array is provided to you where each location has one pair of elements. Let us suppose that (w,x) and (y,z) are two such pairs. You have to write a C++ program to find total number of such pairs of the form
   a. w<y and x>z
   b. w>y and x<z

Also, find display the pair of elements.
NOTE: If such pair of elements are not available display ”NOT FOUND”.

Sample Input: A[] = {(1,4), (3,2), (5,6), (7,8), (9,10), (13, 12), (11, 14)}
Sample Output: (a) 1 : (1,4), (3,2)
(b) 1: (13, 12), (11, 14)

(3) Write a program to find all the possible clustering arrangements from a given number of records.

Sample Input/Output:
Input: Enter the number of records n: 3
Output: Total number of possible clustering arrangements is 5
Clustering arrangements with 1 cluster:
No. of clustering arrangements: 1
The clusters are: {{r1,r2,r3}}

Clustering arrangements with 2 clusters:
No. of clustering arrangements: 3
The clusters are: {{r1,r2},{r3}}, {{r1,r3},{r2}}, {{r2,r3},{r1}}

Clustering arrangements with 3 clusters:
No. of clustering arrangements: 1
The clusters are: {{r1},{r2},{r3}}

Input: Enter the number of records n: 4
Output: Total number of possible clustering arrangements is 15

Clustering arrangements with 1 cluster:
No. of clustering arrangements: 1
The clusters are: {{r1,r2,r3,r4}}

Clustering arrangements with 2 clusters:
No. of clustering arrangements: 7
The clusters are: {{r1,r2,r3},{r4}}, {{r1,r2,r4},{r3}}, {{r1,r3,r4},{r2}}, {{r2,r3,r4},{r1}}, {{r1,r2},{r3,r4}},
{{r1,r3},{r2,r4}}, {{r2,r3},{r1,r4}}

Clustering arrangements with 3 clusters:
No. of clustering arrangements: 6
The clusters are: {{r1,r2},{r3},{r4}}, {{r1,r3},{r2},{r4}}, {{r1,r4},{r2},{r3}}, {{r2,r3},{r1},{r4}}, {{r2,r4},{r1},{r3}}, {{r3,r4},{r1},{ r2}}

Clustering arrangements with 4 clusters:
No. of clustering arrangements: 1
The clusters are: {{r1},{r2},{r3},{r4}}

Submission Instructions:

- Submit your assignment files from LMS within 7 days from the day of your lab slot. Save all the files as per the format RollNo_Lab#_QuestionNo.docx (Example: E18CSE362_Lab1_Q2.docx). Make a single .zip file and upload at a time.
- In the LMS please submit in your respective batch's submission portal. Submission in other batch's submission portal will not be checked.
- Write your Name and Roll No in each page of the design itself. Without this you will score zero for that particular question.
- Provide label/comments in the appropriate place.
- Late submission will lead to penalty.
- Any form of plagiarism/copying from peer or internet sources will lead penalty.