ID1063 Second Lab Exam
CS

Time: 3 hours

Total Marks: 8+8-=16

1. In the generalized Josephus problem, there are n people standing in a circle and labelled 1 through n; there are $n-1$ natural numbers called out: $a_1, \ldots, a_{n-1}$. First, the a_1th person (counting clockwise) leaves the circle, then counting from the next person remaining, the a_2th person leaves the circle, and so on, until only one person remains. An example: let $n = 4$ and the sequence be $5, 2, 3$. Person 1 leaves first, then person 3 leaves, then person 4 leaves. The last person standing is 2. Write a function that accepts an array $a[]$ and an integer n, and finds the number corresponding to the last person.

2. Create a structure called Point that can store the co-ordinates of a point in $\mathbb{R}^2$. Accept a positive integer n and a set of n Points from the user and find the shortest distance among all pairs of points.

   Example run:

   Enter the value of n: 4

   Enter point 1: 3 -1

   Enter point 2: 1.5 1.5

   Enter point 3: 0 1

   Enter point 4: -3 -0.5

   Output: The shortest distance among all pairs is 6.02.