Subject – Data structures   Date: 18-09-2024

Lab assignment- week@9.3.1

The Josephus problem is a well-known theoretical problem in mathematics and computer science, rooted in a historical account of survival during a siege. The problem arises from a recursive elimination process involving people arranged in a circle, where every **K-th** person is removed until only one person remains and that person is declared as the Winner.

You will be given an integer **(N)** denoting the number of players in the game (1, 2, 3, … N) arranged in Circular fashion in the form of Linked List and an integer **(K)** which denotes that every multiple of K person need to be deleted from the list until single player remains. You need to return the winning person number.

Input Format:

The first line contains an integer **(N)** denoting the number of persons.

The next line contains an integer (**K)** denoting the multiple value.

Output Format: Return the winning player number

Sample Test Case:

N = 7

K = 3

Sample Output: 4

Explanation:

Persons in the circle are: [1, 2, 3, 4, 5, 6, 7]. Given that K = 3 i.e., every multiple of Kth

Person needs to be eliminated until we get single person as winner.

In the First Iteration we have players as [1, 2, 3, 4, 5, 6]:

- First, person at position 3 is eliminated resulting the list as: [1, 2, 4, 5, 6, 7]
- Next, person at position 6 is eliminated resulting the list as: [1, 2, 4, 5, 7]
- Then, person at position 2 is eliminated resulting the list as: [1, 4, 5, 7]
- Then, person at position 7 is eliminated resulting the list as: [1, 4, 5]
- Next, person at position 5 is eliminated resulting the list as: [1, 4]
- Finally, person at position 1 is eliminated resulting the list as: [4]

The survivor is the person at position 4. Hence, we return 4 as output.