Smart Coding & Interview Series
Top-20 Basic Program
(Linear List Applications)

First, understand the solution building strategies and coding for the problems in LIVE/VIDEO session and then you apply those strategies discussed in LIVE/VIDEO session to solve the following problems. Use your favourite language(C/C++/Java/C#/Python/Scala) for coding.

1) Singly Linked Implementation for Linear List: In the class/Video, we have discussed the implementation of List using Singly Linked Storage. Implement the same.

2) Implementation of Doubly Linked List using Single Pointer Filed: Implement Doubly Linked List with Single Pointer Filed.

3) Last Man Standing: A king gathers all the men in the kingdom who are to be put to death for their crimes, but because of his mercy, he will pardon one. He gathers the men into a circle and gives the sword to one man. The man kills the man to his left, and gives the sword to the man to the dead man's left. The last man alive is pardoned. With 5 men, the 3rd is the last man alive. Write a program that accepts a single parameter: a number N that represents the number of criminals to start with. The program should output the number of the last two men alive.

Example1

Input: 5

output: 5, 3

Example:

Input: 7

output: 3, 7

4) Broken Keyboard:

https://uva.onlinejudge.org/index.php?option=com_onlinejudge&Itemid=8&category=627&page=show_problem&problem=3139

5) Repeated Josephus: In computer science and mathematics, the Josephus Problem (or Josephus permutation) is a theoretical problem. Following is the problem statement: There are n people standing in a circle waiting to be executed. The counting out begins at some point in the circle and proceeds around the circle in a fixed direction. In each step, a certain number of people are skipped and the next person is executed. The elimination proceeds around the circle (which is becoming smaller and smaller as the executed people are removed), until only the last person remains, who is given freedom. Given the total number

of persons n and a number k which indicates that k-1 persons are skipped and kth person is killed in circle. The task is to choose the place in the initial circle so that you are the last one remaining and so survive.

Example:

If n = 5 and k = 2, then the safe position is 3. Firstly, the person at position 2 is killed, then person at position 4 is killed, then person at position 1 is killed. Finally, the person at position 5 is killed. So the person at position 3 survives.

If n = 7 and k = 3, then the safe position is 4. The persons at positions 3, 6, 2, 7, 5, 1 are killed in order, and person at position 4 survives.