COP 3502C Spring 2019
Midterm Assignment # 2
Deadline Sunday, March, 3, 2019 11:59 PM
Total point: 13

Introduction: For this assignment you have to write a c program that will use the concept of circular queue using circular doubly linked list.

What should you submit?
Write all the code in a single file and upload the .c file.

Please include the following lines in the beginning of your code:

```
/* COP 3502C Midterm Assignment 2
This program is written by: Your Full Name */
```

Compliance with Rules: UCF Golden rules apply towards this assignment and submission. Assignment rules mentioned in syllabus, are also applied in this submission.

Problem

In this assignment, you have to simulate the Josephus problem. There are n number of prisoners 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

For 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.

Input:

n and k

Output:

The position number who will survive.

Requirement:

You must use the concept of circular queue while inserting and it should be implemented using circular doubly linked list. You don’t need to use front and rear as you are using linked list. Root and last node automatically handle that.

Hint: After getting the value of n, generate n numbers (1, 2, 3., …, n) and insert into the doubly circular linked list. Then start deleting nodes based on the value of k until the list has only one node remaining.

Rubric:

1) If code does not compile: 0
2) Use of doubly linked list: 2 point
3) Use of circular linked list: 5 point
4) Incorrect test result per test case: -2 points

Please see the lecture slides and uploaded codes for learning doubly linked lists.