UCS 1302 Data Structures

Tutorial 1 on Stack and Queues

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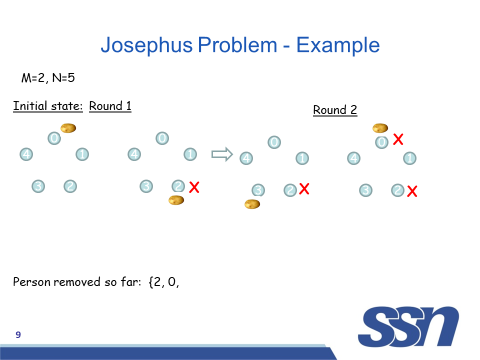
1. Create a data structure *twoStacks*that represents two stacks. Implementation of *twoStacks*should use only one array, i.e., both stacks should use the same array for storing elements. Following functions must be supported by *twoStacks*. (K3, CO2)

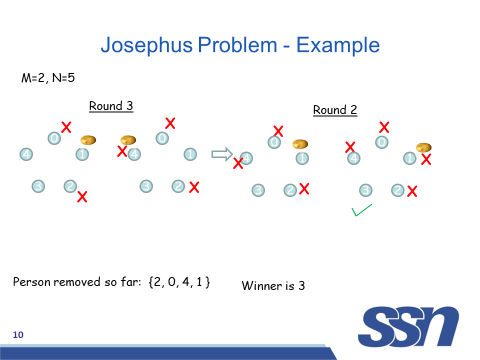
push1(int x) –> pushes x to first stack   
push2(int x) –> pushes x to second stack  
pop1() –> pops an element from first stack and return the popped element   
pop2() –> pops an element from second stack and return the popped element  
Implementation of *twoStack*should be space efficient.

2. The Josephus problem is the following game:

N people, numbered 1 to N are sitting in a circle. Starting at person 1, a hot potato is passed. After M passes, the person holding the potato is eliminated, the circle closes and the game continues with the person who was sitting after the eliminated person picking up the hot potato. The last remaining person wins.

Write an application to find the winning position, given the values of N and M. (K4, CO2)





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