Department of Computer Science and Engineering
Indian Institute of Technology Jodhpur
CSL2020 - Data Structures and Algorithms

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Lab - 9

1. Let us assume that you need **N** books for the preparation of a course however your storage capacity is of only **m** ($m < N$) books. If you want a book which is not there among the current available **m** books, you need to replace the least recently used book with the book you want. You also want that while studying from the available **m** books, each book should be accessible in constant time ($O(1)$).

   We will solve this problem using priority queue, which is implemented using a doubly linked list, and hash table, which stores key corresponding to book id and its address in the queue, and is implemented using array with direct addressing. An empty queue needs to be created in the beginning with **m** nodes.

   Your **C** program will receive input in the following format.

   N m
   L .... (sequence of book ids)

   where **N** and **m** are as defined above. **L** is the length of sequence representing the order in which books are accessed.

   Print the content of the queue after each book access as output.
   [Hint: LRU caching scheme.]