Indian Institute of Technology (ISM), Dhanbad
Department of Computer Science and Engineering

Data Structures Lab(CSC204)

Assignment 8

Full Marks: 50

1 The Problems

Please write the program for both the problems in a single file.

1. Build a singly linked list by taking integer inputs from the user. Given the head of that singly linked list of n nodes and a given integer k, where k is less than or equal to n. Your task is to reverse the order of each group of k consecutive nodes, if n is not divisible by k, then the last group of remaining nodes should remain unchanged. (**25**)

2. Use the linked list constructed in the previous problem and remove the duplicate elements from the list using a hash table where collision resolution is done using chaining. To solve this problem you need to implement the following steps: (**25**)

   (a) Create the input singly linked list using the function implemented to solve problem 1.

   (b) Create a hash table where collision resolution is done using chaining.

   (c) Traverse the linked list and insert the integer into the hash table fs that is not already present. If it is already present in the hash table, then delete that node from the linked list.

2 Sample Input and Output

For Problem 1:
Input: $n = 8$, $k = 3$, $3 -> 6 -> 4 -> 5 -> 6 -> 3 -> 2 -> 1$
Output: $4 -> 6 -> 3 -> 3 -> 5 -> 6 -> 2 -> 1$

For Problem 2:
Input: $n = 8$, $3 -> 6 -> 4 -> 5 -> 6 -> 3 -> 2 -> 1$
Output: $3 -> 6 -> 4 -> 5 -> 2 -> 1$