

United International University
Data Structures and Algorithms I Lab
Home Assignment 1 (Linked List)
Marks: 50

Section 1: Singly Linked List [Marks: 5*5 = 25]

Your task is to implement functions for the following tasks in a singly linked list. You can use the code of the single linked list provided as a template in your class.

1. **Insert into mid position:** This function will take an integer value and insert it in the middle of a linked list. You will have to count the number of elements in a LL to calculate the mid position.
2. **Add all elements of an array at the end of the LL:** You will be given an array of integers. Your task is to add all the elements of the array at the end of the linked list.
3. **Delete k-th element of a LL:** The user will provide the value of k. Your task is to delete the k-th element from the LL. You can traverse the whole LL only once.
4. **Replace the last element of a LL using the sum of the LL:** Your task is to calculate the sum of all the elements in the LL and replace the last element of the LL by the value of the sum.
5. **Search all the even numbers of a LL:** Your task is to traverse the LL and look for the even numbers and put them in an array.

Section 2: Doubly Linked List [Marks 5*5 = 25]

Your task is to implement functions for the following tasks in a doubly linked list. You can use the code of the doubly linked list provided as a template in your class.

1. **Insert into k-th position:** This function will take an integer value and insert it in the k-th position of a double linked list. Set all the pointers correctly. The user will provide the value of k.
2. **Insert into the second last position:** Your task is to insert a specific element into the second last position, that means before the last element.

3. **Find the maximum:** Your task is to find the maximum of all the elements of a linked list.
4. **Delete all the odd elements from the LL:** You will have to delete all the odd elements from the doubly linked list.
5. **Search all occurrences of a specific element:** Your task is to traverse the LL and look for all the occurrences of the element and print the count.

Important Points to Note:

1. You will have to submit one file for each section. Do not zip the files. Only dump them both in the submission link.
2. DO NOT COPY. You will have to face severe penalties in case any kind of plagiarism is found in your submission. No matter whether you are the one provided or you are the one who copied.
3. No submission will be accepted after the deadline set in LMS.