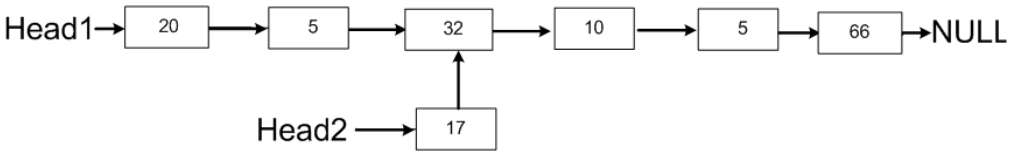
Assignment 2
Data structure and Algorithms (CC2103)

Deadline: - (25-11-22)

1. Given a singly linked list, delete the middle of the linked list. For example, if given linked list is 1->2->3->4->5 then linked list should be modified to 1->2->4->5
   If there are even nodes, then there would be two middle nodes, we need to delete the second middle element. For example, if given linked list is 1->2->3->4->5->6 then it should be modified to 1->2->3->5->6.
   If the input linked list is NULL, then it should remain NULL.
   If the input linked list has 1 node, then this node should be deleted and new head should be returned.
   Note: - There is no variable that will give you total nodes and don't count number of nodes also.
2. Suppose there are two singly linked lists both of which intersect at some point and become a single linked list. The head or start pointers of both the lists are known, but the intersecting node is not known. Also, the number of nodes in each of the list before they intersect are unknown and both list may have it different i.e. Head1 may have n nodes before it reaches intersection point and Head2 might have m nodes before it reaches intersection point where m and n may be m = n, m < n or m > n



3. Implement the output and input restricted Deque with the following options at output screen at the time of execution.
   a. Input Restricted Deque
   b. Out Restricted Deque
      i. Insertion
      ii. Deletion
      iii. Search
      iv. Display
      v. exit
4. Draw a Binary Search Tree by using the following data.
   {23,45,67,57,87,12,25,2,4,27} and delete [45,35]
5. Convert the following infix expression into a postfix expression by the stack.
   (A+B^C)*D+E^F
6. Given the following sequence of letters and asterisks: EAS*Y*QUE***ST***IO*N***

(1) Consider the stack data structure, supporting two operations push and pop. Suppose that for the above sequence, each letter (such as E) corresponds to a push of that letter onto the stack, and each

asterisk (*) corresponds to a pop operation on the stack. Show the sequence of values returned by the pop operations.
(2) Consider the queue data structure, supporting two operations insert and remove. Suppose that for the above sequence, each letter (such as E) corresponds to an insert of that letter into the queue, and each asterisk (*) corresponds to a remove operation on the queue. Show the sequence of values returned by the remove operations

7. The only printer in the student union's office is experiencing an extremely heavy workload. Sometimes there are a hundred jobs in the printer queue, and one may have to wait for hours to get a single page of output. The printer follows a simple FCFS policy for the pages to get printed and so the printing of important page documents gets delayed. We made a slight change in the printing policy by changing the simple FCFS policy to priority-based printing of pages (request) and considering 1 as a high priority. The printer will be provided with: -

   i) A list of requests to be printed
   ii) Priority corresponding to each request
   iii) No of pages per request

   Write down a pseudo code to find the time at which each request gets printed (assuming that the time at which the printing start is 0). Also consider the fact that the **time taken to print each page is 1 sec.**

List of Request	→	A	B	C	D	E	F
Priority	→	1	5	2	3	4	6
No of page per request	→	1	3	10	5	8	7

8. Suppose the following list of data is being inserted into an empty AVL tree. Draw the AVL tree showing the rotation.
   List of data: - 13, 5, 1, 7, 8, 18, 67, 26
   After the creation of the AVL Tree perform deletion of 5, and 7, and show the steps clearly.

9. A binary tree T has 9 nodes. The In-order and Pre-order traversals of T yield the following sequences of nodes. Draw the binary tree T and find post-order also.

In-order	M	K	X	P	Z	O	N	L	B
Pre-order	Z	K	M	P	X	O	L	N	B

10. Write down a program that can be able to find the level of binary tree.
11. Write down a program for the post order traversing using Stack.