

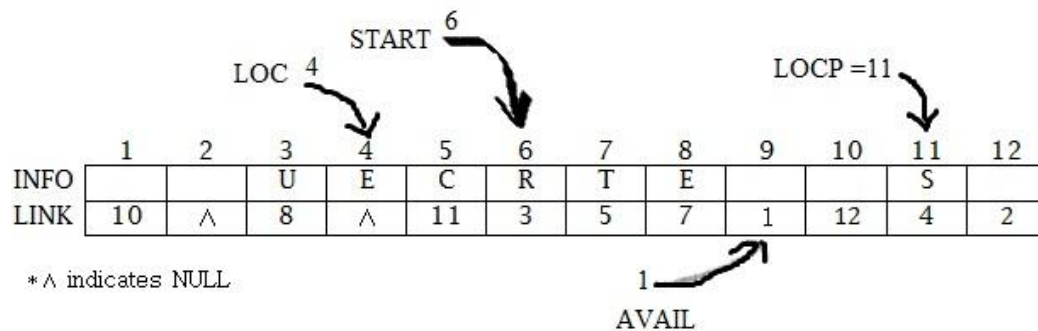
*Heaven's Light is Our Guide*  
**Computer Science & Engineering**  
**Rajshahi University of Engineering & Technology**

## Lab Manual

Module- 05

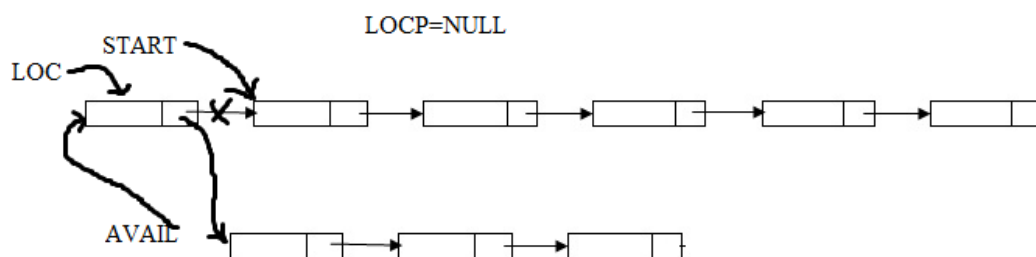
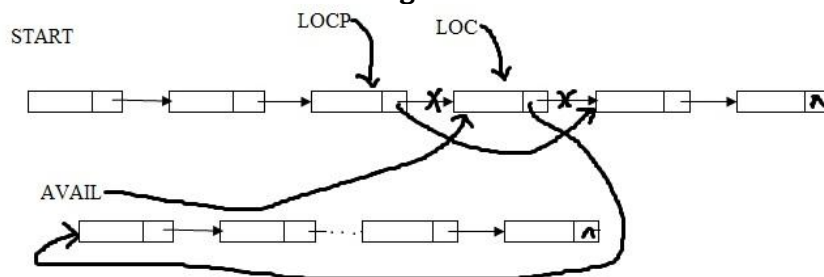
**Course Title:** Sessional based on CSE 1201

**Course No. :** CSE 1202

**Experiment No. 5****Name of the Experiment:** Linked Lists**Duration:** 2 cycles**Background Study:** Chapter 5 (Theory and Problems of Data Structures Written by Seymour Lipschutz)**Fig. 5.1****Problem I:** Delete the node following a given node**Algorithm 5.1: DEL (INFO, LINK, START, AVAIL, LOC, LOCP)**

This algorithm delete the node N with location LOC. LOCP is the location of the node which precedes N or, when N is the first node, LOCP = NULL (See fig. 5.1).

1. IF LOCP=NULL then:  
Set START:=LINK[START]. [Delete First Node]  
Else:  
Set LINK[LOCP]:=LINK[LOC] [Delete N node]  
[End of IF structure]
2. LINK [LOC] = AVAIL and AVAIL := LOC
3. Exit

**Fig 5.2****Fig 5.3****Flow Chart:** Draw a flow chart.

**Problem II:** Delete the node with a given ITEM of information

**Algorithm5.2: Do yourself**

**Flow Chart:** Draw a flow chart.

**Problem III:** Traversing a Circular Header List

**Algorithm5.3:** Let LIST be a circular header list in memory. This algorithm traverses LIST, applying an operation PROCESS to each node of LIST.

1. Set PTR:=LINK[START].
2. Repeat Steps 3 and 4 while PTR  $\neq$  START
3.     Apply PROCESS to INFO[PTR].
4.     Set PTR:=LINK[PTR].
- [End of step 2 loop]
5. Exit.

**Exercise:**

1. Find the location of the first node in circular header list when contains ITEM
2. Delete the node in circular header list with a given ITEM of information

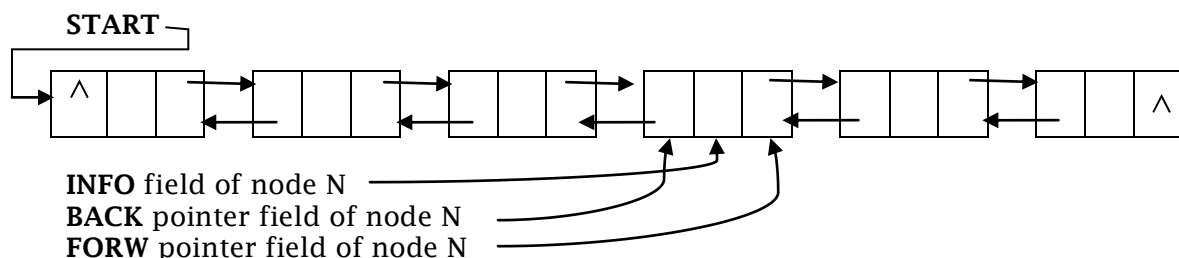


Fig. 5.4: Two way list

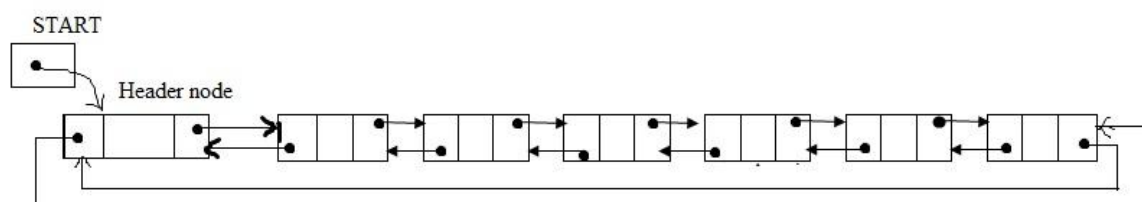


Fig. 5.4: Two way circular header list

**Problem IV:** Traverse a two way list

**Algorithm5.4: Do yourself**

**Flow Chart:** Draw a flow chart.

**Problem V:** Search an ITEM in a two way list

**Algorithm5.5: Do yourself**

**Flow Chart:** Draw a flow chart.

**Problem VI:** Delete a node from a two way list

**Algorithm5.6: DELTWL ( INFO, FORW, BACK, START, AVAIL, LOC)**

1. Set FORW[BACK[LOC]] := FORW[LOC] and BACK[FORW[LOC]]:=BACK[LOC].
2. Set FORW[LOC]:=AVAIL, AVAIL:=LOC, BACK[LOC]:=NULL.
3. Exit.

**Flow Chart:** Draw a flow chart.

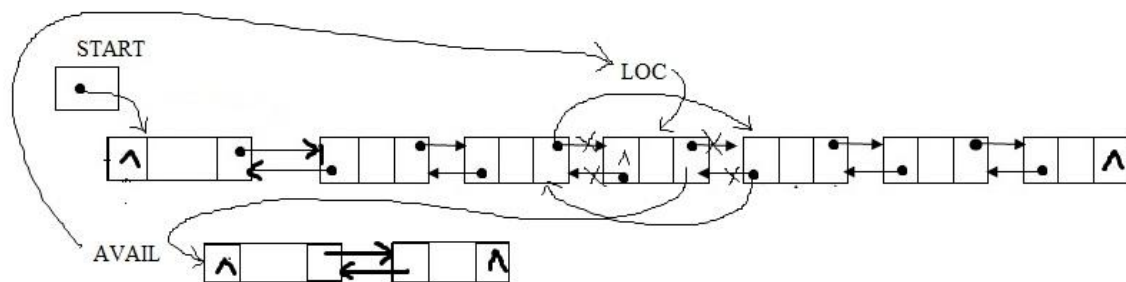


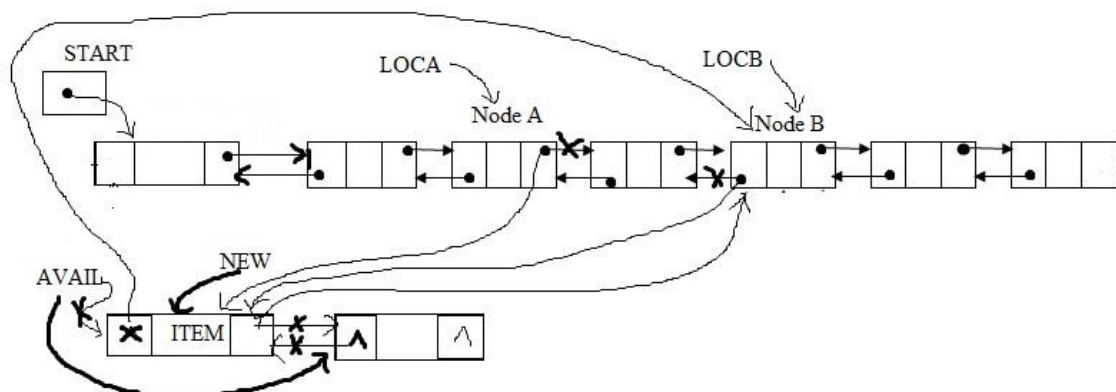
Fig. 5.5: Delete a node

**Problem VII:** Insert a node into a two way list

**Algorithm 5.7:** INSTWL (INFO, FORW, BACK, START, AVAIL, LOCA, LOCB, ITEM)

1. [OVERFLOW?] If AVAIL = NULL, then Write: OVERFLOW, and Exit
2. [Remove first node from AVAIL list]  
Set NEW := AVAIL, AVAIL := FORW [AVAIL], INFO[NEW] := ITEM.
3. [Insert node into list]  
Set FORW[LOCA] := NEW, FORW[NEW] := LOCB, BACK[LOCB] := NEW, BACK[NEW] := LOCA.
4. Exit.

**Flow Chart:** Draw a flow chart.



### MORE PROBLEMS

1. Programming Problems of Chapter 5 of "Data Structures" by Seymour Lipschutz.

**LAB REPORT:** You have to submit all assigned problems in next lab.