CSN-261: Data Structures Laboratory

Lab Assignment 6 (L6)

Instructions:

1. **Use either C/C++ for solving the assignment.**
2. **Array index starts with 0 in C/C++.**
3. **RED color indicates the input in each test case.**

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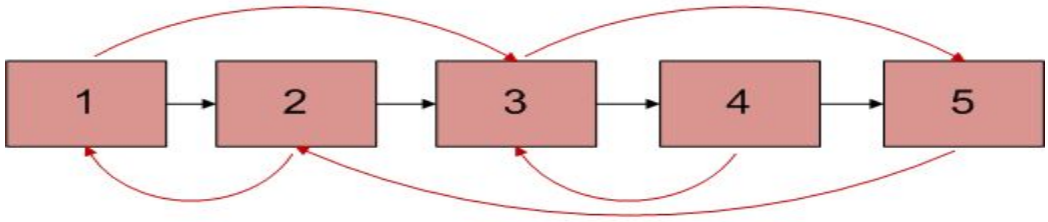
1. You are given a **Doubly Link List** with one pointer of each node pointing to the **NEXT** node just like in a **singly link list**. The **SECOND** pointer however **CAN** point to **any** node in the list and not just the previous node (As shown in Figure).



A. Write a program to create a linked list following the same pattern (as shown in above figure).

Linked list printing format:

Node next pointer second pointer

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1 2 3

B. Write a program in **O(n) time** to duplicate this list. That is, write a program which will create a copy of this list.

C. Write a program to delete any random node (based on user choice in between 1 to 5. After node deletion, the **NEXT** pointer of its predecessor will point to the next node of the deleted node, and all the **SECOND** pointers pointing to the deleted node will point to the node that was pointed by the deleted node's **SECOND** pointer.

D. Write a program to print the highest referenced nodes.

E. Write a program to count the unique number (non-permuted) of cycles in the list and print all the cycles.

Linked list printing format for cycles:

Total number of unique cycles are : 2 (for an example.)
Cycle1: 1 2 1
Cycle2: 3 4 3