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Assignment# 4
CS 302-1004

Part B

- Linked Stack(LIFO) –
    - Stack has only one pointer called StackTop, which points to the top node.
    - Each node of the linked list consists of a 32000 array elements. Whenever an element was added or pushed, it was added to the top of array
    - Removal or pop of element will just remove the top array element.
- Linked Queue(FIFO) –
    - Queue has two pointers QueueFront and QueueRear, pointing first and last node respectively.
    - Each node consists 32000 element array. Adding an element will add in last element of QueueRear.
    - Removal will just remove first element of QueueFront.
- Stack has an advantage in this assignment. We were to reverse the data in this assignment so, just pushing all the items and then poping it in reverse oder. Whereas queue was not that useful.
- Stack used less memory than Queue. For stack, adding and removal was done in the same memory location (LIFO) which allowed to take less memory and memory reuing. But for queue adding and removing was at different location and could not use memory again often.
- For this assignment, using custom data structure was beneficial. Instead of using each node for one item, we used each node and included a 32000 array in it for each item.
- Stack Big-Oh
    - push = $O(1)$
    - pop = $O(1)$
    - top = $O(1)$
- Queue Big-Oh
    - addItem = $O(1)$
    - deleteItem= $O(1)$