ADS

1. Memory efficient doubly linked list:

Insert_front (head, data)
    node new = new node ()
    new→data = data
    new→ptrdiff = head
    if (head != Null)
        head→ptrdiff = head→ptrdiff XOR new
    head = new
    return head;

Insert_rear (head, data)
    node new = new node ()
    new→data = data
    temp = head, prev = NULL
    while (temp != NUL)
        next = prev XOR temp→ptrdiff
        prev = temp
        temp = next
    prev→ptrdiff = prev→ptrdiff XOR new
    new→ptrdiff = prev
    return head

    if (head == NULL)
        new→ptrdiff = NULL
        return new