

ListADT:

User level - grocery list, to-do list, etc...

Logical level - "what" questions
 ordered collection of homogenous data
 every item has unique predecessor
 and successor except 1st and
 last
 operations = get, set, add, remove,
 count, min, max, clone, isEmpty, isFull

Implementation - "How" questions
 static = array
 dynamic = linked

Nov 1-10:07 AM

ListADT Attributes:

ListNode head, tail
 int count

Nov 1-10:14 AM

add(data) - add to end
 add(data, index)

cases:

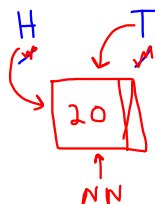
- 1) empty
- 2) at the beginning
- 3) at the end
- 4) middle

Nov 1-10:15 AM

Nov 1-10:15 AM

1) empty - add(20)

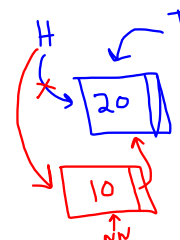
```
nn = new ListNode(20, null)
h = nn
t = nn
count++
```



2) at beginning

add(10, 0)

```
nn = new ListNode(10, H)
H = nn
count++
```



Nov 1-10:17 AM

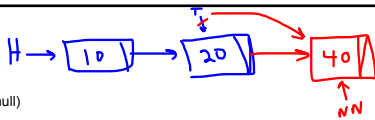
Nov 1-10:21 AM

3) at end

```

add(40)
nn = new ListNode(40, null)
t.next = nn
t = nn
count++

```



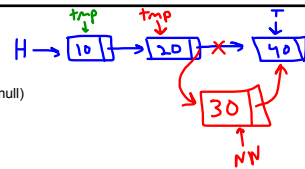
Nov 1-10:25 AM

4) middle

```

add(30, 2)
nn = new ListNode(30, null)
ListNode tmp = H
for 0 to index - 1
    tmp = tmp.next
nn.next = tmp.next
tmp.next = nn
count++

```



Nov 1-10:30 AM

add(data)

```

nn = new ListNode(data, null)
if empty
    h = nn
else
    t.next = nn
t = nn
count++

```

Nov 1-10:41 AM

add(data, index)

```

if index < 0 throw new IllegalArgumentException
if index >= count
    add(data)
else
    if index == 0
        H = new ListNode(data, H)
    else
        ListNode temp = H
        for i = 0 to index - 1
            temp = temp.next
        temp.next = new ListNode(data, temp.next)
    end if
    count++
end if

```

Nov 1-10:41 AM