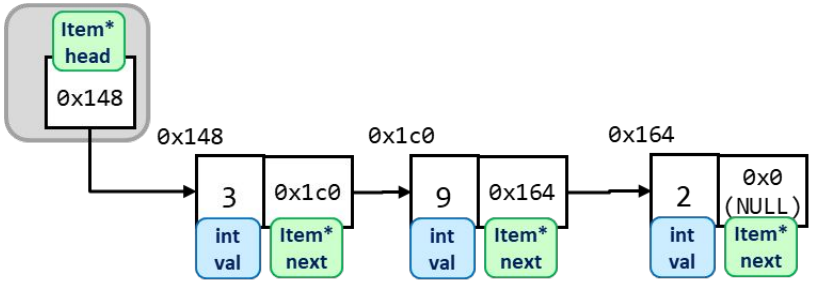
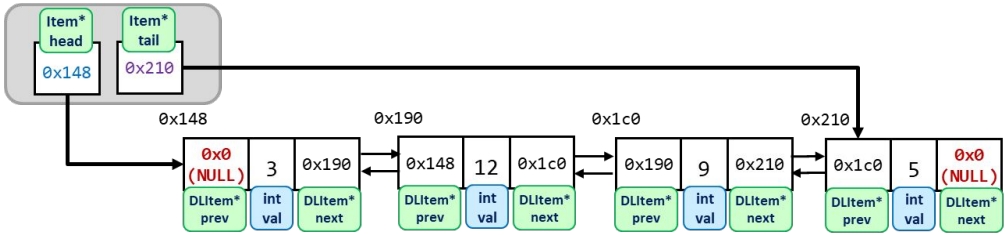
CSCI 103: Introduction to Programming
Lab 10

Linked Lists

- Linked lists can be:
  - **Singly**-Linked
  - **Doubly**-linked
  - Have a **head** ptr only
  - Have a **head** & **tail** ptr
  - Keep a **size** data member (to avoid walking the list)



Singly-Linked List

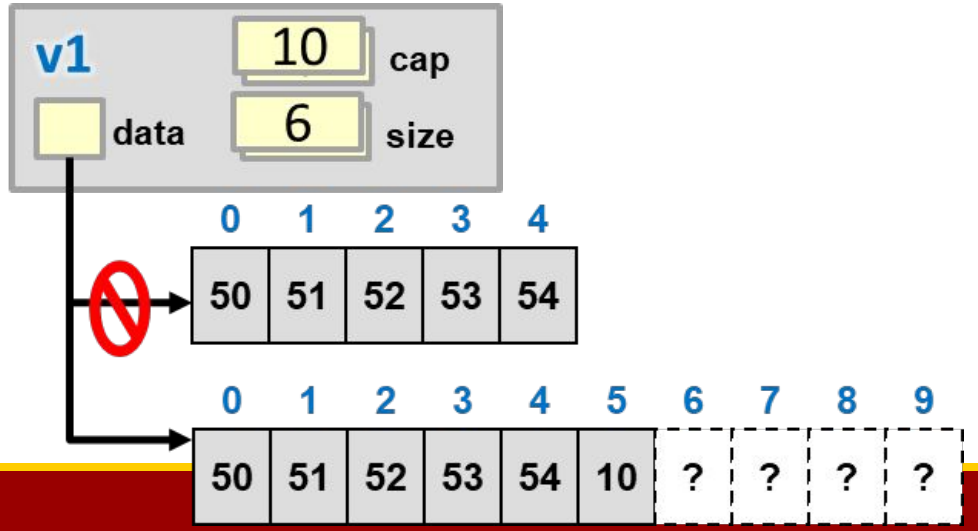


Doubly-Linked List

Vectors

- Are array-based
- Can grow as more items are added (at the cost of reallocating a larger array and copying elements over)

```
vector<int> v1(5);
for(int i=0; i < 5; i++){
  v1[i] = i+50;
}
v1.push_back(10);
// causes a resize behind the scenes
```



Coding Exercise - Preparation for MT2

- **Goal**: Understand different approaches to problems and familiarize yourself with **linked list** and **vector** operations.
- **What**: 7 tasks
  - **Linked Lists:** `add_to_back`, `add_two_to_back`, `remove_first`, `remove_all`, `middle`, `count_occurrences`
  - **Vectors**: `all_neg`, `intersect`, `revll` (reverse linked list to vector), `substring`, `player_details`

Coding Exercise

- **How**: Individual or teams of 2
  - Take a minute and self-organize
  - For teams of 2, recommend "pair programming" - 2 people program as a team on the same computer
    - Both people: think and suggest code
    - One person: types the driver
    - Other person: reads/reviews each line as it is typed, finding and suggesting fixes to errors

Timing

- **Session 1**: 15-20 minutes
  - Write the add_to_back() and add_two_to_back() functions for the linked list.
- **Session 1 Review**: 10 minutes
  - Then TA's check in and review as a whole lab and go over the solution for those two functions (which are need to pass other tests)
- **Session 2**: 45-60 min
    - Work on remaining linked list or vector questions.
- **Session 2**: After the competition the TAs can go over solutions to 2 or 3 exercises based on interest

Get Going

- Find Codio Lab 10
- These slides are on the bytes website
- Make sure to get checked off by a TA at the end to get your 100 grade
  - **For Spring 2024 this is an ungraded lab.**

- Also, please try Sample MT2 on Gradescope and Codio to prepare for the