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)
Vectors

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

```cpp
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