CSDS 233 Spring Session 2

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Disclosure: This is a supplement to class, not a replacement. This should not be your only study activity for exams, it should aid you in studying. I do not have the actual exam so questions here will differ from those on the exam.

Session Objectives:

1) Explain what a linked list is (including how to add remove and search
2) Understand how computer memory works and how that related to array and linked list
3) Decide when to use a list vs array

Practice Problems:

1) **Draw an array with 3 elements (including index)**

2) **Draw a linked list with 3 elements**

3) **Delete the middle element from the linked list in problem 2**

4) **Add an element to the front of the linked list in problem 2**

5) **Complete the following definitions**
    a. Pointer

b. Header

6) **What is the max size of a linked list? What about an array?**

7) **What two pieces of information does every node contain?**

8) **Scenario: you are creating a searchable business receipts program, would you use a linked list or array ? Justify why (There is no right answer this question is about your justification)?**

9) **Scenario: you are creating an archive of customers in alphabetic order, would you use a linked list or array? Justify why (There is no right answer this question is about your justification)?**

10) **Complete the table**

	Array	Linked List (single linked)
Access an item	O( )	O( )
Search for an item	O( )	O( )
Add item to front	O( )	O( )
Add item to back	O( )	O( )
Delete value from middle	O( )	O( )

11) What are the benefits of using a Linked List over an array? (There are 2 big ones)

Coding Problem:

The code can be found here under Session 2: feel free to copy and paste the code into your preferred development environment or you can clone the repository (if you already cloned it you can just pull changes)

https://github.com/jdanninger/CSDS233-Supplemental-Instruction

- The main file contains test cases, feel free to run it
- The LinkedList.java file is partially complete, I created an insert and print method
- You are tasked with creating:
    - Search method that when given an integer returns which index that integer is at or -1 if that integer is not in the linked list
    - Get method that gets the value at a specified index (assume all index are valid)
    - Delete method that deletes a node at a specified index (assume all index are valid)