# CSE 3010 – Data Structures & Algorithms

**Lecture #8**

# What will be covered today

- Simple applications of Stack data structure
  - Reverse an input string
  - Matching braces of a program
- Static vs. Dynamic implementation of data structures
- How do languages support dynamic implementations

# From the world of Java

In a language like Java, operations are implemented by the language. Programmer rarely gets to know how these operations are implemented

```
public class LinkedList<E>
extends AbstractSequentialList<E>
implements List<E>, Deque<E>, Cloneable, Serializable
```

Doubly-linked list implementation of the `List` and `Deque` interfaces. Implements all optional list operations, and permits all elements (including `null`).

All of the operations perform as could be expected for a doubly-linked list. Operations that index into the list will traverse the list from the beginning or the end, whichever is closer to the specified index.

**Constructors**

| Constructor and Description |
|---|
| **`LinkedList()`**<br>Constructs an empty list. |
| **`LinkedList(Collection<? extends E> c)`**<br>Constructs a list containing the elements of the specified collection, in the order they are returned by the collection's iterator. |

***Method Summary***

**All Methods** | **Instance Methods** | **Concrete Methods**

| Modifier and Type | Method and Description |
|---|---|
| `boolean` | **`add(E e)`**<br>Appends the specified element to the end of this list. |
| `void` | **`add(int index, E element)`**<br>Inserts the specified element at the specified position in this list. |
| `boolean` | **`addAll(Collection<? extends E> c)`**<br>Appends all of the elements in the specified collection to the end of this list, in the order that they are returned by the specified collection's iterator. |
| `boolean` | **`addAll(int index, Collection<? extends E> c)`**<br>Inserts all of the elements in the specified collection into this list, starting at the specified position. |
| `void` | **`addFirst(E e)`**<br>Inserts the specified element at the beginning of this list. |
| `void` | **`addLast(E e)`**<br>Appends the specified element to the end of this list. |