CS 314 Exam One Review — Sorted List Insert — **Solution**

Array-based Lists

Recall the `SortedIntList` class we developed in lecture before we developed the `GenericList`. Write an instance method for the `SortedIntList` class which inserts an element into the list. The list must be in sorted order before and after this operation.

Complete the following method.

```
// Adds an element to this list
// pre: val != null, con is sorted from 0 to size - 1
// post: val is inserted at the correct place in the list
public void insert(int val)
```

Here are some example calls to `insert()`:
`[2, 3, 4, 5].insert(1)` → `[1, 2, 3, 4, 5]`
`[1, 2, 4, 5].insert(3)` → `[1, 2, 3, 4, 5]`
`[].insert(7)` → `[7]`
`[1, 2, 3].insert(4)` → `[1, 2, 3, 4]`

Your method will be in the following `SortedIntList` class:

```
public class SortedIntList{
  private int size;
  private int[] con;
  // ...
}
```

Do not use or assume there are any provided methods in the SortedIntList class. Do not use any other Java classes or methods.

```
// Adds an element to this list
// pre: val != null, con is sorted from 0 to size - 1
// post: val is inserted at the correct place in the list
public void insert(int val) {
    if(con.length == size){
        int[] newCon = new int[con.length * 2 + 1];
        for(int i = 0; i < con.length; i++)
            newCon[i] = con[i];
        con = newCon;
    }
    //Find which index we're going to add val
    int index = 0;
    while(index < size && con[index] < val)
        index++;

    //Shift everything to the right of the index
    for(int i = size; i > index; i--){
        con[i] = con[i-1];
    }

    //Put val in its place
    con[index] = val;
    size++;
}
```