CS 2420
Fall semester section 01
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Chapter 19 programming

19.15:

```
public BinaryNode<AnyType> findMin(BinaryNode<AnyType> t )
{
    if(t == null) {
        return t;
    }
    if(t.left == null) {
        return t;
    }
    return findMin(t.left);
}

/**
 * Find the largest item in the tree.
 * @return the largest item or null if empty.
 */
public BinaryNode<AnyType> findMax(BinaryNode<AnyType> t )
{
    if(t == null) {
        return t;
    }
    if(t.right == null) {
        return t;
    }
    return findMin(t.right);
}
```

```
*/
public BinaryNode<AnyType> find(AnyType x, BinaryNode<AnyType> t
{

    //go to the left to see if it is their
    if(t == null) {
        return null;
    }
    else if(x.compareTo(t.element) == 0) {
        return t;
    }
    else if(x.compareTo(t.element) < 0) {
        return find(x, t.left);
    }
    else {
        return find(x, t.right);
    }
}
```

19.27:

```java
@Override
public String toString() {
    if(left == null && right == null) {
        return element.toString();
    }
    if(left == null) {
        return element.toString() + right.toString();
    }
    if(right == null) {
        return left.toString() + element.toString();
    }
    else {
        return left.toString() + element.toString() + right.toString();
    }
}
```

```java
public static void main(String [] args) {
    BinarySearchTree<Integer> b = new BinarySearchTree<Integer>();
    //Top
    b.insert(4);

    //Row 1
    b.insert(2);
    b.insert(6);

    //Row 2
    b.insert(1);
    b.insert(3);
    b.insert(5);
    b.insert(7);

    System.out.println("Tree B shows '" + b.toString() + "'");

    BinarySearchTree<Integer> c = new BinarySearchTree<Integer>();
    //Top
    c.insert(4);

    //Row 1
    c.insert(2);
    c.insert(6);

    //Row 2
    c.insert(1);
    c.insert(3);
    c.insert(7);

    System.out.println("Tree B shows '" + c.toString() + "'");

    BinarySearchTree<Integer> d = new BinarySearchTree<Integer>();
    //Top
    d.insert(4);

    d.insert(6);

    //Row 2
    d.insert(3);
    d.insert(7);

    System.out.println("Tree B shows '" + d.toString() + "'");
}
}
```

Console

<terminated> BinaryNode [Java Application] C:\Program Files\Java\jdk-14.0.2

```
Tree B shows '1234567'
Tree B shows '123467'
Tree B shows '3467'
```