Chapter 19: Programming

19.15 Methods:

```java
34        protected BinaryNode<AnyType> findMin( BinaryNode<AnyType> t )
35        {
36            if( t == null ) return null;
37
38            if (t.left == null) return t;
39
40            return findMin(t.left);
41        }
42
43        /**
44         * Internal method to find the largest item in a subtree.
45         * @param t the node that roots the tree.
46         * @return node containing the largest item.
47         */
48        private BinaryNode<AnyType> findMax( BinaryNode<AnyType> t )
49        {
50            if( t == null ) return null;
51
52            if (t.right == null) return t;
53
54            return findMax(t.right);
55        }
56
57        /**
58         * Internal method to find an item in a subtree.
59         * @param x is item to search for.
60         * @param t the node that roots the tree.
61         * @return node containing the matched item.
62         */
63        private BinaryNode<AnyType> find( AnyType x, BinaryNode<AnyType> t )
64        {
65            if (t == null) return null;
66
67            if( x.compareTo( t.element ) < 0 ) return find(x, t.left);
68            if( x.compareTo( t.element ) > 0 ) return find(x, t.right);
69
70            return t;
71        }
```

19.15 Testing:

Chapter 19: Programming

19.27 Methods:

```java
139        public String buildString()
140        {
141            String ret = "";
142
143            if (left != null)
144            {
145                ret += left.buildString();
146            }
147            if (element != null)
148            {
149                ret += element.toString() + ", ";
150            }
151            if (right != null)
152            {
153                ret += right.buildString();
154            }
155
156            return ret;
157        }
158
159        @Override
160        public String toString()
161        {
162            String built = this.buildString();
163            return built.substring(beginIndex:0, built.length() - 2);
164        }
```

19.27 Testing:

```
c:\Users\wes\github-repos\cs2420_summer2023\Chapter19\Programming - VS Code Console
Running tests for Assignment 19: Smaller trees first, then larger ones
Finished tests
Press any key to continue . . .
```