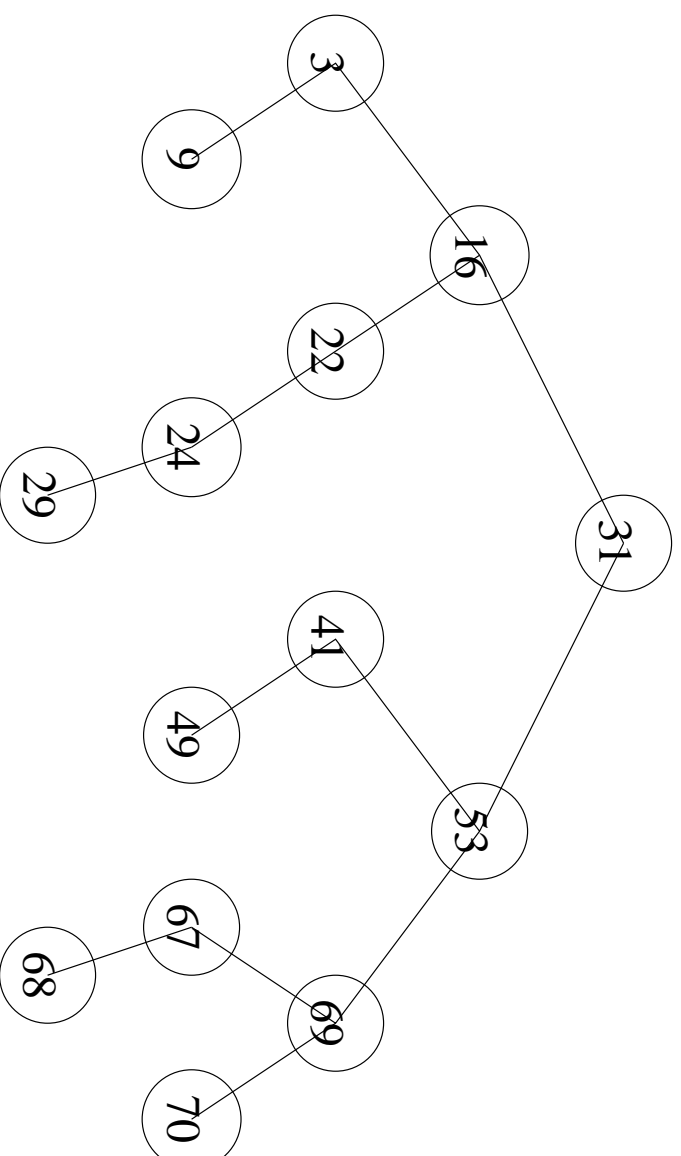# Overview

- Announcements

  - Milestone #2 due date changed to Fri, Apr 7 at 10AM.

  - Exam #2 on Wed, Apr 5 at 7:30PM in DH 1064.

- Binary Search Trees
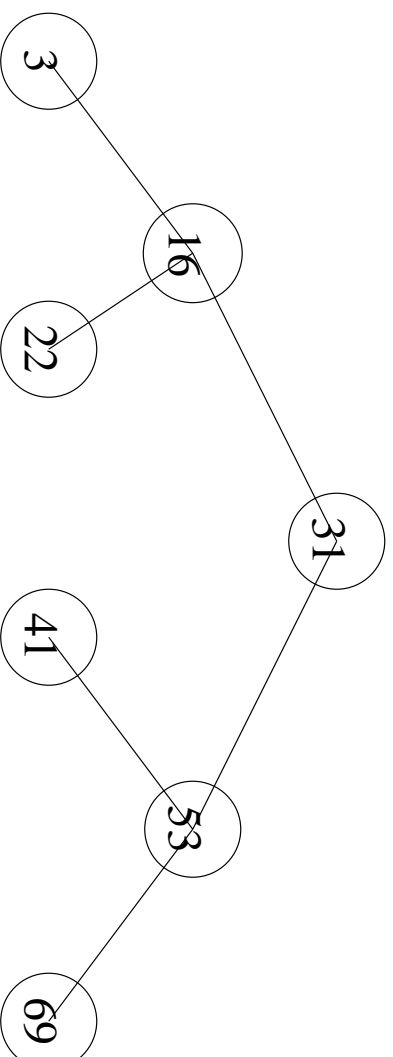
- Iterator Pattern

Binary Search Trees

- In a binary search tree, each node's key is greater than its left child's key and less than its right child's key.

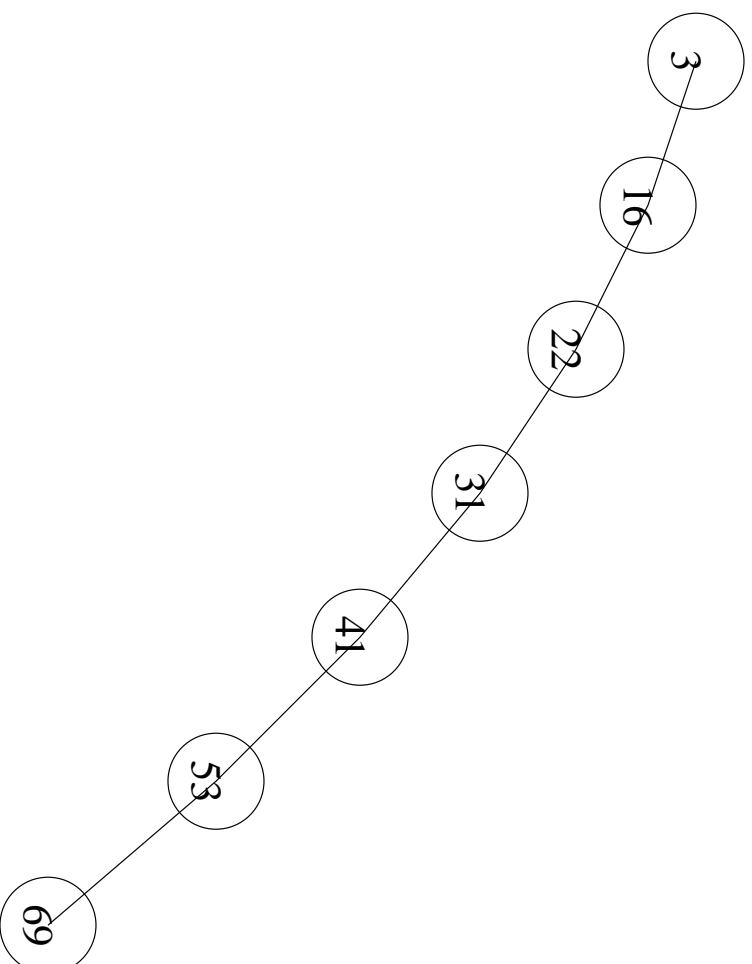# Binary Search Trees (cont.)

- How many steps (in the worst case) would it take to find a key in the following tree?

```
        3
         \
         16
        /  \
      22    31
              \
              53
             /  \
           41    69
```
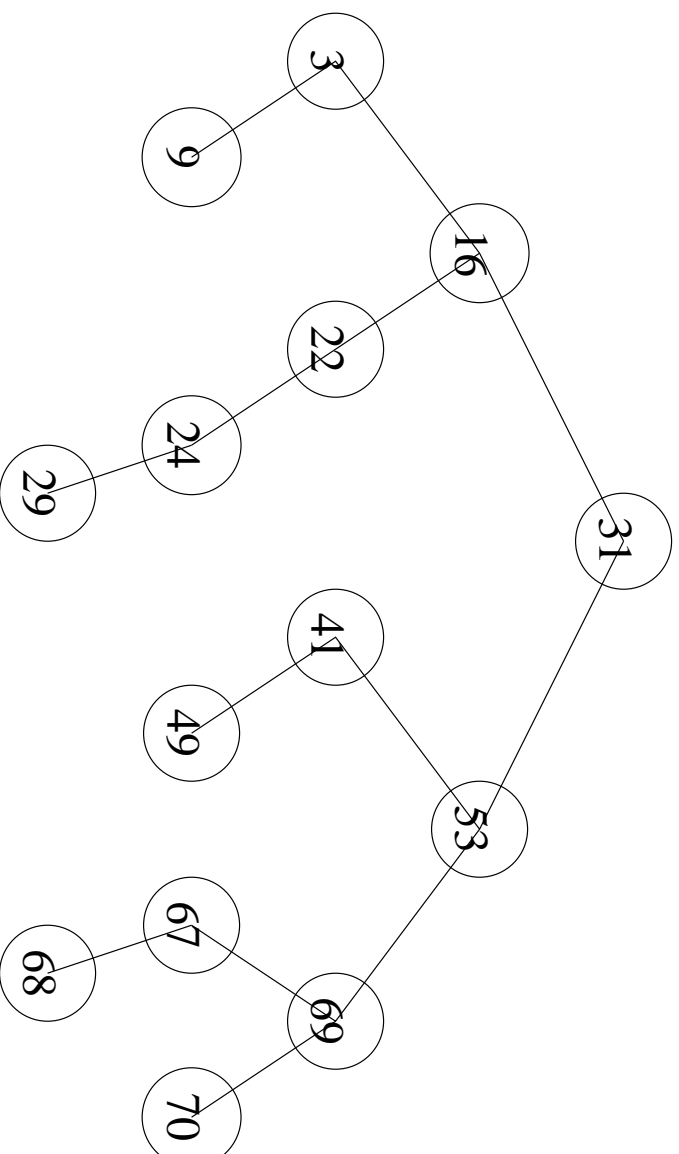
Binary Search Trees (cont.)

- The same keys might be arranged to form a "perfectly" unbalanced tree.

```
        ③
          \
           ⑯
             \
              ㉒
                \
                 ㉛
                   \
                    ㊶
                      \
                       ㊾
                         \
                          ㊿⑨
```

Binary Search Trees Insertion

- Where would 30 go into the following tree? Where would 32 go? Where would 79 go?

```
            3
             \
              16
             /  \
           22    31
          /        \
        24          53
       /           /  \
     29          41    69
                /     /  \
              49    67    70
                   /
                 68
```

Binary Search Trees Deletion

- Deleting a leaf node, e.g., 68, is easy.

- Deleting an "interior" node, e.g., 53, is hard.