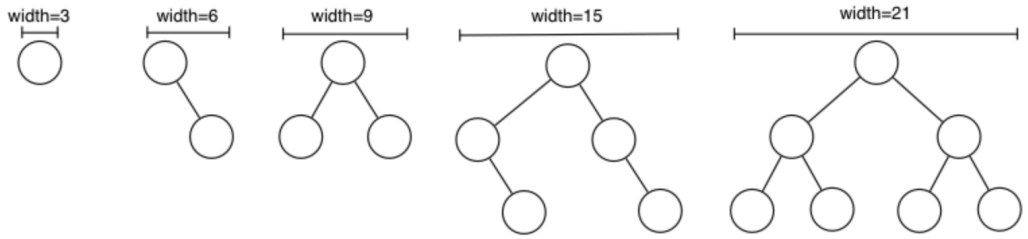
1. (Tree properties)

   a. In the Binary Search Tree ADT (`BSTree.h`, `BSTree.c`) from the lecture, implement the function:

   ```
   int TreeHeight(Tree t) { ... }
   ```

   to compute the height of a tree.

   b. Computing the height/depth of trees is useful for estimating their search efficiency. For *drawing* trees, we're more interested in their *width*. For some simple trees the following diagrams show a useful definition of tree width if you want to keep reasonable spacing:



   Derive a formula for the width of a tree that generalises from the examples and add a new function to the `BSTree` ADT which computes the width of a tree. Use the following function interface:

   ```
   int TreeWidth(Tree t) { ... }
   ```

We have created a script that can automatically test your program. To run this test you can execute the `dryrun` program that corresponds to this exercise. It expects to find the program named `BSTree.c` with your implementation for `TreeHeight()` and `TreeWidth()` in the current directory. You can use dryrun as follows:

```
prompt$ 9024 dryrun BSTree
```

2. (Deletion)

   Consider the BST that results from inserting (at leaf) the following values into an empty tree in the order given:

   ```
   15 4 7 30 42 23 1
   ```

   Then consider executing the following sequence of operations:

   ```
   TreeDelete(t,42);
   TreeDelete(t,15);
   TreeDelete(t,4);
   TreeDelete(t,7);
   ```

   Assume that deletion is handled by joining the two subtrees of the deleted node in the same way as in the lecture (slides Deletion from BSTs and Joining Two Trees) if the node has two children. What is the tree after each delete operation?

Assessment

After you've solved the exercises, go to COMP9024 20T2 Quiz Week 7 to answer 4 quiz questions this week's assessment questions and lecture.

The quiz is worth 2 marks.

The deadline for submitting your quiz answers is **Tuesday, 21 July 11:00:00am**.

A reminder of the **quiz rules**:

Do …

- use your own best judgement to understand & solve a question
- discuss quizzes on the forum only **after** the deadline on Tuesday

Do not …

- post specific questions about the quiz **before** the Tuesday deadline
- agonise too much about a question that you find too difficult