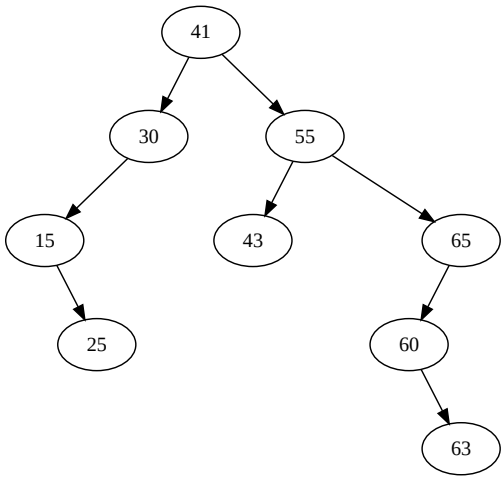
1. (5 points) Consider an empty hash table of length 11, in which keys $17, 22, 11, 36, 28, 41, 19, 30$ are inserted with $h(x) = (x+5) \mod 11$ and separate chaining. What is the total number of *collisions*?

   1. _____

2. (5 points) A post-order traversal of a *max-heap* with 7 elements is $1, 2, \ldots, 6, 7$. What is the sum of all keys in nodes of height $h = 1$?

   2. _____

3. (5 points) Considering the BST below:



   What is the output of a preorder traversal that, for each visit, prints the *height* of the node?

   A. None of the others

   B. 4, 2, 1, 0, 3, 0, 2, 1, 0

   C. 4, 2, 1, 1, 3, 0, 2, 1, 0

   D. 3, 2, 3, 2, 1, 4, 2, 1, 0

   E. 4, 2, 1, 0, 1, 3, 2, 1, 0

   3. _____

4. (5 points) Indicate the sum of the values corresponding to all statements that are `True`. Mark 0 if none are `True`:

   (1) Traversing a BST using *pre-order* results in a sorted list of keys

(2) The worst-case performance of finding the largest element of a BST is $\Theta(1)$

(4) A binary heap is a complete BST

(8) 2^h is the minimum number of nodes in a binary heap of height h

4. _____

5. (5 points) Indicate the sum of the values corresponding to all statements that are `True`. Mark 0 if none are `True`:

(1) The best-case performance of finding the smallest element in a BST is $\Theta(1)$

(2) Any complete tree can be efficiently represented as an array

(4) A binary heap is a complete binary tree

(8) In a max-heap each key is greater or equal to the keys of all ancestors

5. _____