**CIS 263 – Week 2: *Trees***

**Trees**

* Special type of graph A graph with no cycles (i.e., acrylic graph)
* Is this a tree?

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Description automatically generated**

* No, it has a cycle.
* Is this a tree?

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* Yes, there are no cycles.

**Binary Search Tree**

* Properties
  + At most 2 children
  + The keys of a node satisfy the following property:
    - Let x be a nod in a binary search tree. If y is a node in the left subtree of x, then y.key <= x.key. If y is a node in the right subtree of x, then y.key >= x.key.
* Is this a binary search tree?

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* Yes, because values to the left of 12 are less than 12, opposite for values right of 12.
* Inorder Tree Walk:

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* What order are we printing a tree out?
* Searching a binary search tree?
  + We can find things faster.

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* This is an iterative tree search.

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* Finding the minimum in a BST
  + Just keep going down the left of the tree until you get the min.
* Finding the max of a BST
  + Keep going down the right side to get the max.
* Inserting a node:

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* Finding a successor in a BST.
  + The successor of node x is the node with the smallest key greater that x.key.