New program out today, due in 1 week

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- Exhale Credit Exercise today!

- Take out a blank piece of paper and pen/pencil or Lamabe one

Announcement

CS 180 - All Trees
**Inorder Traversal** results in Sorted List

- For any node, left child is smaller + right is greater.

- How fast is Insert? Search? Delete? O(n)

**Height** = Balance to the ...

How could we improve these?

**Search Trees**
Can you read this? What you made it?

Good balanced.

The tree that is

Mega-Graph

Consider this here...
(Question: How do we calculate height?)

- Height of tree <= 2 log₂ n

- at worst 1

- The height of the children differ by

  - For every (internal) node of T,

  - Height-Balance Property:

  - AVL trees:
(Assume NULL leaves are height 0)

What are the heights?
(54) Insert and remove

In other words, how can I change this height?

Now how can we mess this up?
Insert (54)
Let $\times$ be its child.

Let $x$ be its child.

Let all this be properly balanced, hence the node which does not consider the least.
OK, how did you guys fix it?

Hey, we promoted (a) (x, y promoted)

(two demoted p)
Another one: insert(49)

1. Let \( x \) be a child.

2. Let \( x \) be a child.

3. Call this node which does not satisfy height balance condition the lowest node.

4. Another one: insert(49)
How to fix this one?
List them in an inorder traversal:

Generalize: Consider $x, y, z, t$. 
Any way you do it, $\frac{12}{13} + \frac{4}{7} + \frac{4}{25}$ is right.

Third child, left child, I is right.

And a is left child, C is right.

Read off this Subtree, becomes the now any way you do it, be becomes the now.
(c) \( \log_b x \) is to find \( x \) when given \( b \) and \( \log \).

After this, set meaningful points.

Why? 14 points.

(c) How long does this take?