Today’s Goal:

Motivation:
Big-O is defined as:

Visually:

Plan of Action:
We will begin by defining a function that defines the least number of nodes in an AVL tree of height \( h \).

\( N(h) : \)

State a Theorem:
An AVL tree of height \( h \) has at least ____________________.

I. Consider an AVL tree and let \( h \) denote its height.

II. Case: __________________

III. Case: __________________
IV. Case: ________________

By an inductive hypothesis (IH):

We show that:

V. Using a proof by induction, we have shown that:

...and by inverting our finding:

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Summary of Balanced BSTs:

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
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<tbody>
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Iterators ...are amazing!
Three weeks ago today (Sept. 27), you were introduced to iterators.

Iterators:
1. Give client code access to our data
2. Encapsulate access to our data regardless of data structure
   ...and iterators are not new – we provided one for you in MP3!

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Iterators in MP4
As part of MP4, you will write your own iterator:

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FloodFillImage.cpp (partial)

```cpp
ImageTraversal & traversal = /* ... */;
for (const Point & p : traversal) {
}
```

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CS 225 – Things To Be Doing:

1. Exam #6 live now! (Programming exam: lists, trees)
2. MP4 extra credit submission ongoing!
3. lab_avl starts today
4. Daily POTDs