CS 367 - Introduction to Data Structures
Wednesday, July 8, 2015, Lecture 15

Course website: http://pages.cs.wisc.edu/~cstapleton/367/
Piazza: https://piazza.com/wisc/summer2015/cs367/

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Last Time

- Recursion

Today

- Finish Recursion
- Start Trees
- Midterm TOMORROW

Next Time

- Continue Trees
How bad is $2^n$ anyway?

<table>
<thead>
<tr>
<th>n</th>
<th>$n^2$</th>
<th>$2^n$</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>25</td>
<td>32</td>
</tr>
<tr>
<td>10</td>
<td>100</td>
<td>1024</td>
</tr>
<tr>
<td>15</td>
<td>225</td>
<td>32,768</td>
</tr>
<tr>
<td>20</td>
<td>400</td>
<td>1,048,576</td>
</tr>
<tr>
<td>40</td>
<td>1600</td>
<td>1,099,511,627,776</td>
</tr>
<tr>
<td>50</td>
<td>2500</td>
<td>1,125,899,906,842,624</td>
</tr>
</tbody>
</table>
Search techniques

Linear/Sequential Search

Binary Search
Another way to categorize ADTs

Linear

Non-linear
Tree Terminology

Implementing Trees (general)

(Tree) Nodes:

```
    ________ class TreeNode<E> { 
        private E data;
        private ___________<____________> children;
        ...
    }
```

Tree:

```
    public class Tree<E> { 
        private TreeNode<E> root;
        ...
    }
```
public Tree() {
    root = null;
    ...
}

...