Hack 110!

- Comp 110 Hackathon!
- 7:00 PM on Dec 1 to 12:00 PM on Dec 2 in Sitterson Lobby
- Two tracks: web development and game development
- Plenty of workshops + fun!
- Free food + swag!
- *Great for beginners!*
- http://tinyurl.com/app23f
- Apply by Nov 21!
- Questions: Email Kaleb (kalebw02@ad.unc.edu)

CL13 - Recursion

Recursion

- When a process or structure is defined in terms of itself
- Examples:
  - File System
  - Onions/Ogres
  - Tree Branches

Recursion

function data type

- When a process or structure is defined in terms of itself
- Examples:
  - File System
  - Onions/Ogres
  - Tree Branches

NOTE:
Like loops, recursion needs to terminate!

Structures

Recursive Data Type:

- Contains itself as an attribute/part of an attribute

```
class Node:
    data: int
    next: Node
```

In Memory

```
class Node:

    data: int
    next: Node
```

VS Example…

Ending Recursion

- Terminates on a **base case**
- Recursive attribute replaced with None type

In Memory

```python
class Node:
    """My Node class for linked lists."""

    data: int
    next: Node | None

    def __init__(self, data: int, next: Node | None):
        """Construct Node."""
        self.data = data
        self. next = next
```

```python
node_c = Node(2, None)
node_b = Node(1, node_c)
node_a = Node(0, node_b) #head of list
```