Functions

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Today’s topics

• Review of Chapter 6: Functions
• Go over examples and questions
• functions in Python
Functions review

• How do we define a function? Call a function?
• How do we manage local variables in memory?
  – What is the heap?
• What is a return value?
  – What happens if there are multiple return statements?
  – What happens if there are no return statements?
Let’s go over the exercises
Functions in python

```python
def add(num1, num2):
    print "I am adding " + str(num1) + " and " + str(num2)
    return (num1 + num2)
```

add(2,3)
add(4,5)
add(-1,1)

• **def** is a keyword to define a function, ends in a colon
• must name the function (add in the example)
• arguments (num1 and num2) are optional; between parentheses
• everything indented that belongs to the function
• **return** statement is optional; only first return statement reached gets run
  – if no return statement, function returns **None**
• function can be called, with arguments, after declared
Local variables

• The arguments, and any variables declared in the function are local variables
  – cannot be seen by other functions or code
  – arguments given values in function call
  – even if they have the same names as variables outside the function, the computer treats them as different (think of two people both named Sally; they are different people though they happen to be named the same)
Reminder: print versus return

- A return statement ceases execution of a function and returns a value
  - At most one (the first) return statement that is reached during a particular function call is executed
- All print statements reached by the function are executed; they are printed to the screen
- A returned value is not printed
  - unless we did
    
    ```
    print add(2,3)
    ```
Importing existing functions

```python
from mathLib import *
```

```python
add(2,3)
add(4,5)
add(-1,1)
```

- Imagine we saved the `add()` function in a file called `mathLib.py`
- `from ... import *` allows us to import all functions from `mathLib.py` into the current file
  - we can use `add()` without defining it here
  - python imports some functions, like `str()` and `len()` automatically; others need the import statement
  - existing standard libraries are documented online and can also be imported
Questions?