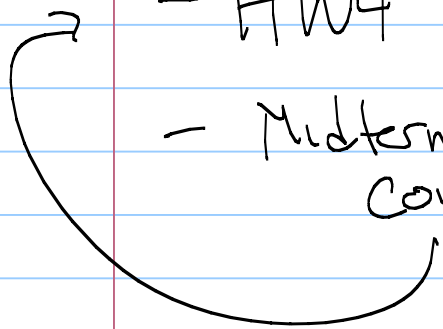# CS150 - Functions (part 2)

Announcements

- HW3 is due tonight

- HW4 is posted, due in 1 week

- Midterm 1 will be next week
  cover material up through 5.2

  ↑
  functions

Last time:

```
def    nameOfFunction ( input1, ..., inputk ) :
          body
          return  value

#Normal  program
code  to  run
        :
```

functions go at the top

Ex: Finding longest element in a list

There is a max function in the list class.

Uses >= comparison to find maximum.

On a list of strings, which string will it return?

'Apple' < 'Jello' → last in alpha. order

Write function to find longest string in a list.

Function inputs

When the function is run, the program essentially sets each variable equal to what it will be called in the function.

Ex: def prta(a):
    print 'a=', a

prta(3)
prta('b')

a = 3
a = 'b'

Mutable versus immutable

What's the difference?

mutable: changable - lists
immutable: can't be changed - tuples,
strings

Python treats these very differently
inside a function.

Example

```
def fun(a, b):
    a += 1
    b.append(1)
```

$\leftarrow$ $a = 1$
$b = [1]$

```
x = 1
y = [1]
fun(x, y)
```
print

Output: x is 1
         y is [1, 1]

Optional Parameters

In functions, you can specify input parameters that are optional. input

This means if the main program specifies parameters, the function will use those.
Otherwise, the function will plug in the optional parameters automatically.

Ex:

```
def countdown():
    for i in range(10):
        print i
```

Add input parameters, & then optional ones:

Practice Problems

Practice 5.18 : Do this problem by hand, then code it & see if you were right.

Practice 5.19 : Redo our gcd algorithm as a function $gcd(u, v)$.