

# A201/A597 Introduction to Programming I

First Summer 2007



Lecture Notes for Friday June 1st, 2007 (ED1204)

Functions Revisited (Chapter 6). Today: Parameters.

1. Functions without parameters can still be useful, for example if they report the time.
2. Functions with parameters can't make changes to them visible from the calling code.
3. Changes to elements inside list parameters are visible from the calling code. There is no contradiction with (2) above, since the elements are shared, as explained below. The value of the parameter is still copied, so a direct change (entire list) would not be visible from the code that calls the function. Examples follow:

```
>>> a = 1
>>> b = a
>>> b = b + 1
>>> a
1
>>> b
2
>>>
```

This is the basic mechanism. Here's the exact same thing with lists:

```
>>> a = [1, 2, 3]
>>> b = a
>>> b.append(10)
>>> b
[1, 2, 3, 10]
>>> a
[1, 2, 3, 10]
>>>
```

The part that would behave the same would be:

```
>>> a = [1, 2, 3]
>>> b = a
>>> b
[1, 2, 3]
>>> b = [6, 5, 4]
>>> a
[1, 2, 3]
>>> b
[6, 5, 4]
>>>
```

So the value b holds is truly a copy of a, but is an address. The list itself is shared.

```
>>> a = [1, 2, 3]
>>> b = a
>>> b[1] = -2
>>> b
[1, -2, 3]
>>> a
[1, -2, 3]
>>>
```

We discussed two examples, both thanks to DwuengChwuan Jhwueng.

First the question was, how can we actually create a copy of the list?

```
def copy(seq):
    result = []
    for elem in seq:
        result.append(elem)
    return result

a = [1, 2, 3]
b = copy(a)
print a
print b
b[1] = -10
print a
print b
```

Second, if we delegate processing to a function, how can the result influence control in the calling code? Here's the example:

```
import random

def deter(guess, secret):
    if guess < secret:
        print "higher"
        return False
    elif guess > secret:
        print "lower"
        return False
    else :
        print "get it"
        return True

def main():
    secret = random.randrange(10)+1
    done = False
    while not done:
        guess=int(raw_input("Enter:"))
        done = deter(guess, secret)

main()
```