

# A201/A597 Introduction to Programming I

First Summer 2007



Lecture Notes for Friday May 25, 2007 (ED1204)

Introduction to Functions (Chapter 6). Today: basic notions.

We worked out three examples:

1. Print the contents of a matrix, when implemented with nested lists:

```
def show(matrix):
    for row in range(len(matrix)):
        for col in range(len(matrix[0])):
            print str(matrix[row][col]).rjust(4),
            print

show([[1, 2, 3], [-10, 100, 0], [12, 1, 200]])
```

Notice how information about the size can be deduced from the matrix itself.

2. Sort a list of integers:

```
def sort(seq):
    sorted = False
    while sorted == False:
        sorted = True # always start with hope
        for ind in range(len(seq)-1):
            if seq[ind] > seq[ind+1]: # sort ascending
                temp = seq[ind]
                seq[ind] = seq[ind+1]
                seq[ind+1] = temp
            sorted = False
    print seq

sort([1, 2, 1, 3, 1, 4, 1, 3, 2, 0])
```

3. Generate a random list of integers:

```
import random

def generate(size):
    result = []
    for ind in range(size):
        result.append(random.randrange(-50, 50))
    return result
```

One can use this in conjunction with the previous function as follows:

```
def sort(seq):
```

```
sorted = False
while sorted == False:
    sorted = True # always start with hope
    for ind in range(len(seq)-1):
        if seq[ind] > seq[ind+1]: # sort ascending
            temp = seq[ind]
            seq[ind] = seq[ind+1]
            seq[ind+1] = temp
        sorted = False
print seq
```

The definition is repeated here just for convenience.

```
a = generate(10)
print a
sort(a)
```

Just put everything (shown at this step) in one file, then run it.

Here's an example of output:

```
>>>
[8, -27, 2, -11, 23, 32, 22, 41, 23, -45]
[-45, -27, -11, 2, 8, 22, 23, 23, 32, 41]
>>>
```

This was the first example of using `return` to provide a value to the code that calls the function. A brief discussion further explained the difference between `return` and `print`.