Introduction to Computer Programming
CSCI-UA 2

Functions
Functions and Modules

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Functions

Function Syntax

def name(parameters):
    statements

A return value is not required

return None

Anything besides return are called “side effects”

A print() statement is an example of a side effect
Variables
Local and Global

Variable scope is something we must pay attention to when using functions.

When and where is a variable accessible to your program?

Local variables are only usable within the function they are local to.

Global variables are usable by any function or code within your program.
Local Variables

def area(rad):
    import math
    return math.pi * rad ** 2

When this function ends, \texttt{rad} is automatically deleted because it is local.
Global Variables

```
rad = 5

def area():
    import math
    return math.pi * rad ** 2

def change_rad(new_rad):
    rad = new_rad

This program will not allow rad to be changed because it is global

To change the radius variable:
    global rad
```
Main Function

main()

It is both common and a good idea to use a main function in your programs. This is usually the starting point of a program and is run by typing: main()

This simplifies rerunning programs and as well as passing input values.
Function Parameters

Used to pass input into a function

Python passes values by reference

Default values can be set for parameters

def name(parameter = 'default')
Modules

A module is a group of related functions

Different from a regular Python program in that it acts like a toolbox

A module usually does not have a `main()` function

To use a module, simply import it
Importing Modules

Import functions individually:

```python
import module_name
module_name.function()
```

Import functions all at once:

```python
from module_name import *
function()
```
Namespaces

Functions within a module are available when you import them

Modules form namespaces

Different modules with the same function name will not clash in the same program

module1.function(parameter)
module2.function(parameter)

The only time functions may conflict is when you import all using \*
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