4.10: FRUITFUL FUNCTIONS AND VOID FUNCTIONS

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Some of the functions we are using, such as the math functions, yield results; for lack of a better name, I call them *fruitful functions*. Other functions, like `print_twice`, perform an action but don't return a value. They are called *void functions*.

When you call a fruitful function, you almost always want to do something with the result; for example, you might assign it to a variable or use it as part of an expression:

```
x = math.cos(radians)
golden = (math.sqrt(5) + 1) / 2
```

When you call a function in interactive mode, Python displays the result:

```
>>> math.sqrt(5)
2.23606797749979
```

But in a script, if you call a fruitful function and do not store the result of the function in a variable, the return value vanishes into the mist!

```
math.sqrt(5)
```

This script computes the square root of 5, but since it doesn't store the result in a variable or display the result, it is not very useful.

Void functions might display something on the screen or have some other effect, but they don't have a return value. If you try to assign the result to a variable, you get a special value called `None`.

```
>>> result = print_twice('Bing')
Bing
Bing
>>> print(result)
None
```

The value `None` is not the same as the string "None". It is a special value that has its own type:

```
>>> print(type(None))
<class 'NoneType'>
```

To return a result from a function, we use the `return` statement in our function. For example, we could make a very simple function called `addtwo` that adds two numbers together and returns a result.

CODE 4.10.1 (PYTHON):

```
def addtwo(a, b):
    added = a + b
    return added

x = addtwo(3, 5)
print(x)

# Code: http://www.py4e.com/code3/addtwo.py
```

run restart

When this script executes, the `print` statement will print out "8" because the `addtwo` function was called with 3 and 5 as arguments. Within the function, the parameters `a` and `b` were 3 and 5 respectively. The function computed the sum of the two numbers and placed it in the local function variable named `added`. Then it used the `return` statement to send the computed value back to the calling code as the function result, which was assigned to the variable `x` and printed out.