Lecture 7: Functions Worksheet Solutions

1) Open Processing and type in the following function definition. Also create *empty* **setup**() and **draw**() functions. What happens when you press Play? Why is this?

```
// computes the fictitious "half-plus-seven" age dating rule
float halfPlus7(float age) {
  return age/2 + 7;
}
```

Nothing happens (other than a blank canvas opening)! You have to call a function to use it.

2) Now add the following line to **draw**(). Make sure that it is indented inside of **draw**()! What happens when you press Play? Why is this?

```
float f = halfPlus7(18);
```

Still nothing! The return value gets stored in the variable f, but then ignored/not used (Processing warns you of this).

3) Now change the line in **draw**() to the following. What happens when you press Play? Why is this?

```
println(halfPlus7(18));
```

It continually prints out "16.0" to the console because draw runs in an infinite loop.

4) Move the **println**() statement from Question 3 to **setup**() then add another call to halfPlus7() so that it now reads:

```
println(halfPlus7(halfPlus7(18)));
```

First, *predict* what you think will happen when you execute this program. Now press Play and verify!

The return value of the first halfPlus7 call (16.0) is passed as the input to the second halfPlus7 call, printing "15.0" to the console just once because it's in setup now.

5) Now delete the parameter list in the definition of halfPlus7(). List the TWO errors that appear. Hint: click on any red underline that you see.

The function "halfPlus7()" does not expect any parameters
The variable "age" does not exist

6) Below we describe a few new functions that we are designing. Based on the descriptions, decide on (a) the return type and (b) the parameter list (how many parameters, what data types, and what names you will use).

As a reminder, here are some common datatypes:

`int` – integers (positive and negative whole numbers)
`float` – decimal numbers (includes integers)
`color` – color (specified in RGB format)
`boolean` – `true` or `false`

The function `drawUW` will draw a UW logo centered at a specified coordinate (x,y) at a specified size.

```
__void__  drawUW(_float x, float y, float size_____)
{
  ...
}  // note that int would work instead of float, but is more
limited
```

The function `inch2cm` will convert someone's height from inches to centimeters (1 inch = 2.54 cm).

```
__float_ inch2cm(_float height_____)
{
  ...
}
```

The function `isOdd` will tell you whether or not a specified number is odd (*e.g.* 1, 3, 5).

```
_boolean isOdd(_int number_____)
{
  ...
}
```

The function `pickColor` will give the user a randomly-selected color.

```
__color_ pickColor(_____)
{
  ...
```

```
}   // no parameters needed!
```