Lab 5 – Thursday June 14, 2018

This lab covers:

- if statements
- functions

Question 1

The purpose of this question is to write a python program (script) that computes the stepwise function given in equation (1) shown below.

$$f(x)=\begin{cases}0, \text{if } x=0\\ 3, \text{if x is a multiple of 3}\\ 2, \text{if x is a multiple of 2}\\ 1, \text{otherwise}\end{cases} \qquad (equation 1)$$

Write a function that begins with the following header:

```
def f(x):
```

This function must implement the stepwise function given in equation (1) shown above and return 0, 1, 2 or 3 as appropriate. There must be only one return statement in your function (multiple return statements are not allowed in this course). Some integers such as 6 are multiples of both 2 and 3, for numbers like this the function should return 3.

The main program must test f(x) by calling it with the integer values -6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5 and 6 for x. The values for x can be created using a **range** in a **for** statement.

The output from the program should be similar to that shown below.

```
------------------------------------------------------------

 x       f(x)
-6        3
-5        1
-4        2
-3        3
-2        2
-1        1
 0        0
 1        1
 2        2
 3        3
 4        2
 5        1
 6        3

Programmed by Stew Dent.
Date: Thu Jun  7 09:21:52 2018
End of processing.
```

Question 2

The purpose of this question is to write a python program (script) that contains a function that determines if a value passed to it is between a lower and upper bound.

Write a function that begins with the header:

```
def validateBoundedInt(value, bound):
```

This function must determine if the *value* passed to it is between a lower and an upper bound. Use *bound* as the upper bound and –*bound* as the lower bound.

The function must perform the following tests:

- if *value* is not an integer return the value of *value* and the message 'is not an integer!' as a string.
- if *value* is an integer but is less than the lower bound return the value of *value* and the message 'is too small!' as a string.
- if *value* is an integer but is greater than the upper bound return the value of *value* and the message 'is too large!' as a string.
- otherwise return *value*.

The main program is to test the function *validateBoundedInt* by calling it with each of the following values for *value*: -101, -100 -1, 0, 1, 101, 100, True, 1.5, and 'hello'. Store these values in either a list or a tuple. Use a **for** statement to access each element of the list or tuple and pass the element to *validateBoundedInt*. The value of *bound* must be 100. If the type of the result returned by *validateBoundedInt* is an integer display the result followed by the message 'is a valid integer!', otherwise display the result.

The output from the program must be similar to the following.

```
------------------------------------------------------------

-101 is too small!

-100, is a valid integer!

0, is a valid integer!

1, is a valid integer!

101 is too large!

100, is a valid integer!

True is not an integer!

1.5 is not an integer!

hello is not an integer!

Programmed by Stew Dent.
Date: Thu Jun  7 09:25:33 2018
End of processing.
```