COSC 101: Fall 2017
Lecture 07: Functions

1) Goal: Understanding What Functions Do for Us.
   a) Listen to the song. Identify and circle the chorus in the song.
   b) How would we edit the lyrics to the song if we wanted to show the words to the chorus only once?
   
   c) How do we read the lyrics to sing the song if the chorus lyrics are only printed once?

2) Goal: Know Your Function Basics.
   a) Label the parts (function keyword, function call, formal parameters, function header, function body, end of function, function arguments, doc string, loop variable, accumulator variable) of the program below (numbers to the left are line numbers not part of the program):

   ```python
   def maxmindiv(x, y):
       l = max(x, y)
       m = min(x, y)
       return l//m

   s = 0
   for i in [12, 6, 18, 9]:
       s += maxmindiv(i, l)
       l = i
   print(s)
   ```

   b) What is the result of the above program?
c) What is the result if we indented the print(s) statement? Why?

d) What is the result if we indented line 5? Why?

e) What is the result of the program below?

def vowelcheck(w):
    if (w=='a' or w=='e' or w=='i' or w=='o' or w=='u'):
        return True

def wordplay(w):
    new_word = ""
    for ch in w:
        if not vowelcheck(ch):
            new_word += ch
        else:
            new_word += 'e'
    return new_word

w = "soup"
print("The word new word created from", w, "is:", wordplay(w))
The program below uses the turtle module to draw a picture (purposely given without comments). What kind of picture does it draw?

```python
import turtle

def drawsquare(t, sz):
    """Draws a square of the specified size""
    for i in range(4):
        t.forward(sz)
        t.left(90)

def mysteryfunc(t, sz, c):
    t.color(c)
    t.begin_fill()
    drawsquare(t, sz)
    t.end_fill()

wn = turtle.Screen()
ted = turtle.Turtle()
my_sz = 50
for i in ["Blue", "Green", "Orange", "Purple"]:  
mysteryfunc(ted, my_sz, i)
ted.penup()
ted.forward(my_sz)
ted.pendown()

ted.forward(my_sz)

wn.exitonclick()
```

g) What color is the single line at the end drawn in? Why?
3) **Goal: Using Functions**

We want to write a program that computes a person’s net pay. Their net pay is based on their salary and hours worked less the taxes they have to pay.

a) How should we break this program down?

b) Write a function called `compute_gross_pay` that takes two parameters: an hourly pay rate (in dollars) and the number of hours worked. The function should compute and return the gross pay. Your function should handle overtime pay: any hours over 40 are paid at 1.5 times the hourly rate.
c) Write a function called `compute_taxes` that takes a gross pay amount and returns the amount of tax to be collected. Taxes are computed based on the following table:

<table>
<thead>
<tr>
<th>Gross Pay</th>
<th>Tax Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;= 5000</td>
<td>12.5%</td>
</tr>
<tr>
<td>&gt; 5000</td>
<td>17.5%</td>
</tr>
<tr>
<td>&gt; 10000</td>
<td>25%</td>
</tr>
</tbody>
</table>

d) Write a program that computes and prints a user's gross pay, taxes, and net pay (gross pay minus taxes). The program should ask the user's name, how much the user makes per hour, how many hours she worked, then call the functions you wrote above to obtain the user's gross pay and taxes. You should then print out the gross pay, taxes, and net pay.