CS116 – Iterating through all of a list - Part 2

Purpose: In this module we will continue with processing all the items in a list but look at fancier conditionals that may be used.

Skills: After completion of this module you should be able to

1. Write if-else conditionals

2. Write if-elif-else conditionals

Knowledge: This module will help you become familiar with the following content knowledge:

1. Logical operators in conditionals

Schema:

Conditionally process each item in a list

```
for item in list:
    if item has property:
        process item
    else:
        process item another way
```

or

```
for item in list:
    if item has property:
        process item one way
    elif item has a second property:
        process item a second way
    ...
    else:
        process item a last way
```

Activity: With your group perform the following tasks and answer the questions. You will be reporting your answers back to the class in 30 minutes.

1. Recall the following is a method in the Text class which prints the words in the text which are small words.

```
def printSmallWords(self):
    for word in self.getWords():
        if (len(word)<3):
            print(word)
```

How could we modify this method so that it will print each word in the text and label it as either small or large? For example:

```
This: large
is : small
a: small
test: large
```

2. Consider the following expressions and **predict** their values before typing each in the console:
Hint: The % operator takes the remainder of integer division.

```
x = 5
x > 0 and x < 10
x > 6 and x < 10
x > 0 or x % 2 == 0
x > 0 and x % 2 == 0
not (x > 0 and x % 2 == 0)
```

What does the **and** operator do?

What does the **or** operator do?

What does the **not** operator do?

3. Consider the following code which posterizes a picture:

```
def posterize(self):
    for p in self.getPixels():
        r = p.getRed()
        g = p.getGreen()
        b = p.getBlue()
        if r <64:
            p.setRed(31)
        elif r > 63 and r <128:
            p.setRed(95)
        elif r > 127 and r < 192:
            p.setRed(159)
        else:
            p.setRed(223)

        if g <64:
            p.setGreen(31)
        elif g > 63 and g <128:
            p.setGreen(95)
        elif g > 127 and g < 192:
            p.setGreen(159)
        else:
            p.setGreen(223)

        if b <64:
            p.setBlue(31)
        elif b > 63 and r <128:
            p.setBlue(95)
        elif b > 127 and r < 192:
            p.setBlue(159)
        else:
            p.setBlue(223)
```

This method reduces the red, green, and blue each to one of four values.

How does the red value change if it is a value of 50?

How does the red value change if it is a value of 100?

How does the red value change if it is a value of 192?

Complete each of the following assignments to be submitted for grading. Each should be done individually but you can consult with a classmate to discuss your strategies or if you get an error message that you do not understand.

For each of these problems it will help if you ask yourself the following questions:

1. What is the list I am processing?

2. What type of value is each individual item in the list?

3. What processing needs to be done for each individual item in the list?

Assignment 1:

Write a text method which prints whether each word in the text is small, medium, or large. A small word is less than three letters, a large word is greater than 6 letters, and a medium word is in between.

Criteria of Success: The method when applied to a text object correctly prints the labels for each word in the text.

Assignment 2:

We can turn an image into just black and white by taking the pixels with luminance less than 64 to black and all other pixels to white

Write a method `blackAndWhite(self)` in the MyPicture class that modifies the image as described.

Criteria for Success: The black and white waterlilies is shown below:

Assignment 3:

Andy Warhol was an American artist. He began his career as a commercial illustrator and then became a famous painter. His style combined techniques from commercial illustration popular at the time. We will somewhat mimic his work with a Picture method. This method sets the color to blue if the luminance is less than 32, magenta if between 32 and 64, orange if between 64 and 96, yellow if between 96 and 128, and pink if greater than 128.

Criteria for Success: The warhol method applied to waterlilies is shown below:

Submit your python files with your methods in Canvas for grading.