Exercises File Processing and using Modules:

Questions 1, 2, 3 are taken from Chapter 6, Building Python Programs, A Back to Basics Approach by Stuart Reges, Marty Stepp, and Allison Obourn. **ISBN-10:** 0135205980, **ISBN-13:** 978-0135205983 (Not yet in print).

Question 4 is adapted from the online course CS101 at Stanford University, https://web.stanford.edu/class/cs101/image-3-exercises.html

Questions 1 and 3 are the assessed questions.

1. Write a function called `flip_lines` that accepts a file name as a parameter. Your function should read it and write to the console the contents of the file with each pair of lines reversed in order. For example, if the file contains:

```
Twas brillig and the slithy toves
did gyre and gimble in the wabe.
All mimsey were the borogroves,
and the mome raths outgrabe.
```

your function should produce the following output:

```
did gyre and gimble in the wabe.
Twas brillig and the slithy toves
and the mome raths outgrabe.
All mimsey were the borogroves,
```

2. Write a function called `coin_flip` that accepts an input file name as a parameter. The input file contains coin flips that are heads (H) or tails (T). Consider each line to be a separate set of coin flips and output the number and percentage of heads in that line. If it is more than 50%, print "You win!". Consider the following file:

```
H T H H T
T t   t  T h  H
```

For the input above, your function should produce the following output:

```
3 heads (60.0%)
You win!

2 heads (33.3%)
```

3. Write a function called `leet_speak` that accepts two parameters: an input file name, and an output file name. Convert the input file's text to "leet speak," where various letters are replaced by other letters/numbers, and output the new text to

the given output file. Replace "o" with "0", "l" (lowercase "L") with "1" (the number one), "e" with "3", "a" with "4", "t" with "7", and an "s" at the end of a word with "Z". Preserve the original line breaks from the input. Also wrap each word of input in parentheses. For example, if the input file contains the following text:

```
four score and
seven years ago our
fathers brought forth on this continent
a new nation
```

For the input above, your function should produce the following in the output file:

```
(f0ur) (sc0r3) (4nd)
(s3v3n) (y34rZ) (4g0) (0ur)
(f47h3rZ) (br0ugh7) (f0r7h) (0n) (7hiZ) (c0n7in3n7)
(4) (n3w) (n47i0n)
```

This question is optional

4. To complete this question you will need to use the Python pillow module. If you are using Python on your own computer then follow the instructions to install the python module.

   Your program will use the image 'banana.jpg'. An image is made up of array of pixels. Every pixel in a JPG image contains three values: one value for the amount of red colour in the pixel, one value for the amount of green in the pixel and the final value for the amount of blue in the pixel. Colour values must be within the range 0-255. Pixel values can be represented by a tuple, (0, 0, 0) where is black and (255,255,255) is white. Use this RGB calculator to find the values for other colours.

   You will write a function called `negative_filter` that accepts a file name as a parameter. A negative filter replaces each color with its inverse by subtracting the current red, green, or blue value from 255. Write the negative image to a new file called 'negative_banana.jpg'. More information on using Pillow library to edit pixels can be found here. the You can use the code snippet below to get started:

```
in_image = Image.open("banana.jpg")     # Create an Image object from the file
in_pixelMap = in_image.load()           # Create an array from the Image

out_image = Image.new('RGB', in_image.size, "black") # Create an output image
out_pixelMap = out_image.load()                      # Create an array

width, height = in_image.size          # Get the width and height of the image
```

Further problems can be found in any of the course textbooks.