CS 171
Lab Assignment 6
Object-Oriented Programming

This lab assignment uses many elements provided in the main bibliographic reference for these lectures:
Programming in Python 3

A Complete Introduction to the Python Language,
2nd Edition,
Mark Summerfield

1 Exercises

Exercise 1 *Create the* `Shape` *Module that is referenced in the slides for Chapter 6, and include in it the* `Point` *class.*

You can/should use the code that is already provided.

Import the module to a console, and experiment creating your own points and manipulating them using the provided functionality.

□

Exercise 2 *Include the definition of class* `Point3D` *in the* `Shape` *module.*

Tests each of the functions defined in it.

□

Exercise 3 *Complete the following definition a class, named* `Circle` *class, to hold and manipulate circles.*

The special method `__init__()` *is already provided.*

```
class Circle:
    def __init__(self, x, y, radius):
        self.p = Point(x, y)
        self.radius = radius
```

In addition, you should:

1. *re-implement methods* `__eq__()`, `__repr__()` *and* `__str__()`*;*
2. *implement new methods* `area()` *and* `circumference()` *to calculate the area and the perimeter of a circle;*
3. *test all the functionality you implemented by creating and manipulating circles.*

□

Exercise 4 *Confirm that you can obtain the image shown on slide 39. For this, you can use:*

1. *the* `Image` *module that is provided, and*
2. *the program presented on slide 38.*

□

Exercise 5 *You should further study the* `Image` *module that is provided.*

1. *What image is being constructed in the module's docstring?*
2. *What is furthermore being tested on the docstring?*

□

Exercise 6 *Change the program you used in Exercise 4 to obtain different image patterns.*

1. *You can start with simple patterns such as:*

   https://danadudesign.wordpress.com/portfolio/20-pattern-simple-squares-black/

   or

   https://danadudesign.wordpress.com/portfolio/19-designer-dots-paper-cover-pattern/

2. *And then explore more adventurous patterns that you can imagine or search on your own.*

□

Exercise 7 *Having reached this point, you are strongly encouraged to:*

1. *Study in detail and provide solutions to the exercises presented in Chapter 6, Section Exercises, starting on page 285 of the reference book.*

□