Assignment 1

Due date: Friday January 22th 2021, at 11:00pm
Weight: 10% of final mark

The purpose of this assignment is to complete the Python class `graphicsWindow` found in file `graphicsWindow.py`. You are asked to program a method `drawLine(p1,p2,color)` that draws a line in the image from point `p1` to point `p2` with color `color`. The points `p1` and `p2` are expressed as matrices $(x, y)^T$ (column vectors). The color is a tuple of the form `(r,g,b)`, where `r,g,b` are values between 0 and 255.

The method `drawLine(p1,p2,color)` must implement Bresenham's integer line drawing algorithm correctly, for lines of all slopes, and be properly documented (Header comments: description of parameters, what the method does, and description of output. Code comments: description of non-obvious sections of code).

- The class `graphicsWindow` is available in the Resources Section of OWL, under Python Programs
- Do not change file name nor the actual name of the `graphicsWindow` class
- Make sure your method `drawLine(p1,p2,color)` is actually called `drawLine`
- Respect the type and order of the parameters
- Use the program `testAssignment1.py` to test `drawLine(p1,p2,color)`. This program is available in the Resources Section of OWL, under Python Programs
-
- The output of the test program should correspond exactly to the image `assignment1Image.png`. This image is available in the Resources Section of OWL, under Python Programs
- Use OWL to submit the file `graphicsWindow.py`, containing your method `drawLine(p1,p2,color)`
- You must use Python 3.7 and PyCharm 2018.2 or above for this assignment. In addition `PIL` and `numpy` must be installed for the assignment to work correctly

Marking Scheme and Submission

- **Working program** (50%): A working program which satisfies all of the requirements automatically receives 50% of the total assignment mark. Each element of non-compliance will be penalized with respect to its severity

- **Program Structure** (25%): A program which follows the structured programming rules (procedural, modular, uses parameters) to perfection automatically receives 25% of the total assignment mark. Marks are deducted depending on severity and number of occurrences of non-compliant elements

- **Program Documentation** (15%): Documentation should be complete. That is to say, every non trivial part of the code should have a *clear* comment that explains it. In addition, every method or function, including the main program should have an explicative comment header. This header includes: module name, author, date of creation and purpose. A description of parameters and their classification as either input or output parameters. Marks are deducted according to the absence of these elements

- **Program Style** (10%): Style refers to Occam's razor principle. Code that is needlessly tricky, obscure, or difficult to read will be marked accordingly. Program text indentation is also an element of style and must be present. Significant constant, variable and structure names must be used. Marks are deducted on the basis of the frequency of these errors

- **Submission**: Through OWL exclusively. Only attachments are allowed