This assignment will give you practice with variables, arithmetic statements, functions, and conditions, as well as an introduction to programming design.

Requirements

You are to write a program which computes and prints out the equation for a line, given two points on that line, \((X_1, Y_1)\) and \((X_2, Y_2)\). This program should be called assignment1.py.

Computing the Equation of a Line

As you may (or may not) remember from geometry, any two points determine a line. We will call those points \((X_1, Y_1)\) and \((X_2, Y_2)\).

Any line in two-dimensional space may be defined by the following equation:

\[ y = m \times x + b \]

where

- \(m\) is the slope of the line.
- \(b\) is the y-intercept (that is, the value of \(y\) when \(x\) is 0).

This can be computed from the following formulas:

\[ b = Y_1 - m \times X_1 \]

\[ m = \frac{Y_1 - Y_2}{X_1 - X_2} \]

Input and Output

Your program should prompt the user for the X and Y coordinates of the two points (don’t forget that you will have to convert that input to a numeric type!), and then display the slope and y-intercept of the line. For example:
Design Issues

A few things that you should think carefully about before you start programming:

- What type your variables should be.
- Any type conversion you will need to do (particularly when you input the coordinates).
- What order your computations should be done in.

Documentation and Readability

Your program must be well documented and readable. This includes:

- Informative comments explaining what major sections of your code do, and how they work.
- A header briefly describing the function of the program as a whole. Your name should also be in this header.
- Descriptive variable names.
- Appropriate spacing between sections of code.

Keep in mind that this will be a significant part of your grade!

What to Turn In

Email your assignment1.py program to me at jrsullins@ysu.edu.

- The assignment1.py program should be an attachment to the email.
- The subject of the email should be “1595 Assignment 1 from your name”.

```python
>>> Enter the x coordinate of the first point: 1.5
>>> Enter the y coordinate of the first point: -0.5
>>> Enter the x coordinate of the second point: 2
>>> Enter the y coordinate of the second point: 1
The equation of the line is y = 3.0 x + -5.0
```