MSPA 400: Session 1 Python

Reading

Think Python 2nd Edition Chapter 2, and Chapter 3 (3.1 to 3.3), Chapter 8 (8.1 to 8.2)

Think Python 3rd Edition Chapter 2, Chapter 3 (pages 23-25), Chapter 8 (pages 85-88)

Module 1

(Session 1 Module 1.py)

Objectives:

1. Demonstrate the order of computational operations with integers and floating point numbers.
2. Introduce strings and demonstrate string manipulations.
3. Use built-in Python functions.
4. Demonstrate calculations using Python.
5. Execute script using Enthought Canopy.

Output from Module 1.py:

Integer calculations

2 -8 -2 0 -1 3

Floating point calculations and conversions

-2.0 4.0 3.0

-1.5 0.75 0

Note the type conversions integer to floating point: -1 -1.0

Order of Operations calculations

11 15 1.41421356237

-8.0 -2.0 0.0625

Combination of Functions and operations: 1 -4.0 -4

String operations

a x 3 aaxaaxaaxaaxaax 15

Examples of concatenation and use of len() and indexing:

aaxbbb aaxbbb123123 12 1 1

Quadratic Formula Section R.4 Example 4 Lial

Root_1= 5.0

Root_2= -1.0

3.14159 rounded to two decimal places is 3.14

Exercises:

1. The volume of a sphere with radius r is (4/3)(pi)r**3. What is the volume of a sphere with radius 5? (392.6 is wrong!)
2. Suppose the cover price of a book is $24.95, but bookstores get a 40% discount. Shipping costs $3 for the first copy and 75 cents for each additional copy. What is the total wholesale cost for 60 copies?
3. If I leave my house at 6:52 am and run 1 mile at an easy pace (8:15 per mile), then 3 miles at tempo (7:12 per mile) and 1 mile at easy pace again, what time do I get home for breakfast?

Module 2

(Session 2 Module 2.py)

Objectives:

1. Demonstrate computational capabilities of Python.
2. Illustrate some of Python's printing and plotting capabilities.
   (This will require importing software that provides the necessary capabilities. Matplotlib and numpy are commonly used.)

Output from Module 2.py

linear equation construction

slope of line = 0.4

Value of y if x is 1.0 equals 2.4

Equation of a line is y = y1 + slope*(x-x1)

x1 equals 5.0 and y1 equals 4.0

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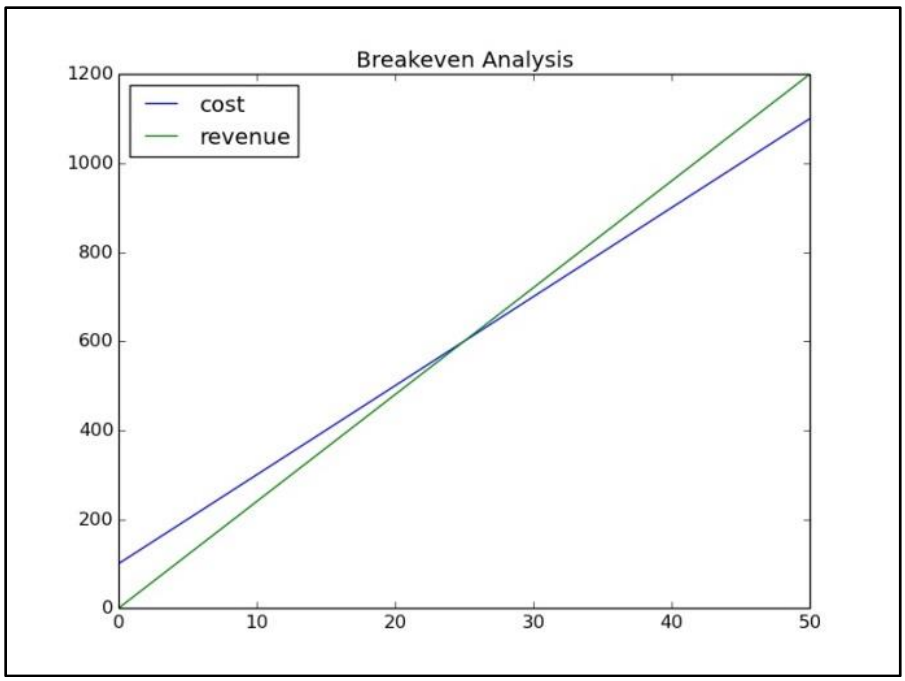

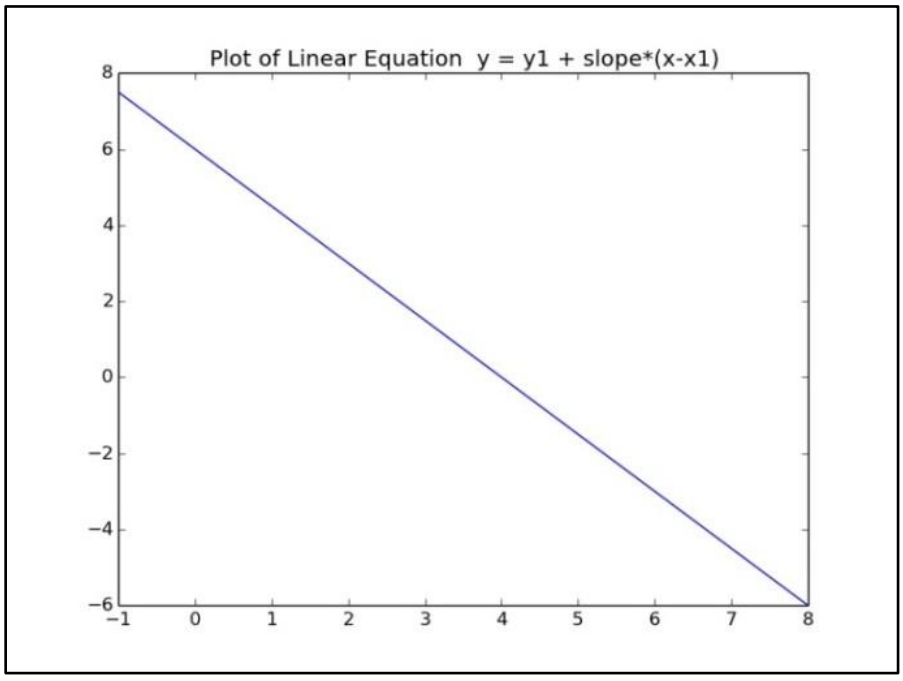

Exercises:

1. Use Python graphically to solve the supply and demand problem shown in Example 2 Section 1.2 of Lial. Compare your code and plot to the answer sheet.

2. Using Python as a calculator, calculate the correlation coefficient in Example 4 of Section 1.3 of Lial. Compare your code and computed result with the answer sheet.