MSPA 400 Session 1 Python Solutions

Module 1:

(Note, the interpreter was be used to solve these exercises):

Exercise 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!)

```
In [2]: r=5.0

In [3]: pi=3.14159

In [4]: volume=(4.0/3)*pi*r**3

In [5]: round(volume,1)
Out[5]: 523.6
```

Exercise 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?

```
In [1]: price=24.95

In [2]: discount=0.4

In [3]: cost=60*(1-discount)*price+3+0.75*59

In [4]: round(cost,2)
Out[4]: 945.45
```

Exercise 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?

```
In [1]: start=6*60+52

In [2]: time=2*(8+15/60.0)+3*(7+12/60.0)

In [3]: total=start+time

In [4]: hour=int(total/60)

In [5]: minutes=round((total%60),0)

In [6]: hour
Out[6]: 7
```

MSPA 400 Session 1 Python Solutions

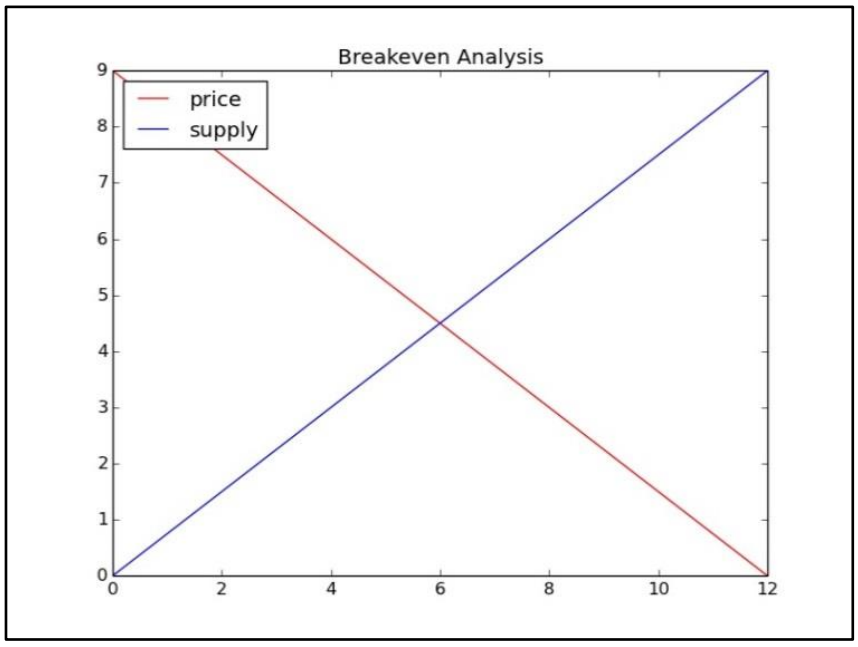
Module 2:

Color Codes:

character	color
'b'	blue
'g'	green
'r'	red
'c'	cyan
'm'	magenta
'y'	yellow
'k'	black
'w'	white

Exercise 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.

```
figure()
q= linspace(0,12,100)
price= 9-0.75*q
supply= 0.75*q
plot (q,price, 'r')
plot (q,supply, 'b')
legend (('price','supply'),loc=2)
title ('Breakeven Analysis')
show()
```



MSPA 400 Session 1 Python Solutions

Exercise 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.

```
In [1]: n=10

In [2]: x=550.0

In [3]: y=595.5

In [4]: xy=28135.0

In [5]: x2=38500.0

In [6]: y2=38249.41

In [7]: r=((n*x2-x*x)*(n*y2-y*y))**0.5

In [8]: r=(n*xy-x*y)/r

In [9]: r
Out[9]: -0.9629005849512889
```