CS 115 - Introduction to Programming in Python

Lab 06

Lab Objectives: Explore Jupyter, 2D Lists, numpy.

Instructions: In this question, you will use Jupyter Notebook. Write your solutions in this notebook, rename it as SS_Lab06Q2_Surname_FirstName.ipynb where SS is the section number 01, 02, 03, etc. and upload all solution to Lab06 assignment on Moodle before the end of your lab session.

** Question 2**

You will use numpy arrays to store and manipulate data from files. Complete the steps listed below:

import numpy for use in your code

In [18]:

```
import numpy as np
```

Read data from the files product.txt, which contains the prices of a number of products and quantity.txt, which stores their quantities, into two numpy arrays.

In [19]:

```
prices = np.loadtxt('product.txt', skiprows=1)
quantity = np.loadtxt('quantity.txt')
```

Display the prices and quantities.

In [20]:

```
print('Prices:',prices)
print('Quantities:',quantity)
```

```
Prices: [[ 87.   66.   22.5  90.  105. ]
 [100.   10.   22.   87.   45. ]]
Quantities: [[100.  57.  22.  96. 115.]
 [ 46. 115.  54.  20.  70.]]
```

Increase the price of each product by 15% and display the updated prices.

In [21]:

```
prices = prices * 1.15
print('Prices:',prices)
```

```
Prices: [[100.05   75.9    25.875 103.5   120.75 ]
 [115.     11.5    25.3   100.05   51.75 ]]
```

Find and store the totals in a new array by multiplying the prices by the quantities and display the totals.

In [22]:

```
totals = prices * quantity
print('Total:',totals)
```

```
Total: [[10005.    4326.3    569.25  9936.   13886.25]
```

```
 [ 5290.    1322.5   1366.2   2001.    3622.5 ]]
```

Save the totals to a file, totals.txt

In [23]:

```
np.savetxt('totals.txt',totals)
```

Decrease each quantities in the array by 10 and save to a file, updated_quantity.txt

In [24]:

```
quantity = quantity - 10
np.savetxt('updated_quantity.txt',quantity)
```

Calculate the percent change of each quantity and store in a new array. For each quantity display the percent change.

In [25]:

```
decrease = (10 / (quantity+10))*100
print('Quantity percent decrease:',decrease)
```

```
Quantity percent decrease: [[10.         17.54385965 45.45454545 10.41666667  8.69565217]
 [21.73913043  8.69565217 18.51851852 50.         14.28571429]]
```

Calculate and display the total quantities for each row.

In [17]:

```
row = np.sum(quantity, axis = 1)
print('First row sum: ',row[0])
print('Second row sum: ',row[1])
```

```
First row sum:  340.0
Second row sum:  255.0
```

Calculate and display the total quantities for each column.

In [26]:

```
cols = np.sum(quantity, axis = 0)
print('First row sum: ',cols[0])
print('Second row sum: ',cols[1])
```

```
First row sum:  126.0
Second row sum:  152.0
```