CIS 106 – Loops Part 2

For each problem prepare an IPO chart. Then write the code for each. Save the IPO within this document and upload to your repository. After code is complete upload the files (.py) to your repository. Paste the link to your repository into the assignment completion link in Blackboard.

1. Allow the user to enter a principle amount and interest rate. Repeatedly (need a loop to control the program execution) compute the annual interest (principle x rate). Compute ending balance to be principal (beginning balance + interest). Display year, beginning balance and ending balance for each of the first 5 years. Display the accumulated interest for the 5 years. Note: the new balance by year (this will be the principle for the following year. ***Format the output*** to look like the example below.

Example:

Enter principle amount: 10000.00

Enter interest rate: 0.10

Formatted output

Year Beginning Ending

Balance Balance

1. $10,000.00 $11,000.00
2. $11,000.00 $12,100.00
3. $12,100.00 $13,310.00
4. $13,310.00 $14,641.00
5. $14,641.00 $16,105.00

Total interest earned: $6,156.00

| Input | Process | Output |
| --- | --- | --- |
| Principle amount  Interest rate | For 5 years  Annual interest = principle \* rate  Ending balance = principle + interest | Year (5 total)  Principle amount  Ending balance  Accumulated interest over 5 years |

1. Fibonacci sequence is a sequence of natural order. The sequence is:

1, 1, 2, 3, 5, 8 etc. where it is a series of numbers that starts with 0 and 1, and each subsequent number is the sum of the two preceding numbers.

Use a for loop compute and display first 20 numbers in the sequence.

| Input | Process | Output |
| --- | --- | --- |
| n1 = 0  n2 = 1 | for 19 times  n3 = n1 + n2  n1 = n2  n2 = n3 | n2, n3 repeating |

1. Create a text file that contains employee last name and salary. Read in this data. Determine the bonus rate based on the chart below. Use that rate to compute bonus. For each line display the employee’s last name, salary and bonus. After the loop display the sum of all bonuses paid out.

Salary Bonus Rate

100,000.00 and up 20%

50,000.00 15%

All other salaries 10%

Example file (create your own data with at least 5 employees:

Adams  
50000.00  
Baker  
75000.00  
Smith  
45000.00  
etc.

| Input | Process | Output |
| --- | --- | --- |
| From file:  Last name  Salary | Bonus = salary \* bonus rate | Last name  Salary  Bonus  Sum of all bonus |

1. Create a text file with item, quantity and price. Read through the file one line at a time. Compute the extended price (quantity x price). For each line display the item, quantity, price and extended price. After the loop display the sum of all the extended prices, the count of the number of orders and the average order.

Example Data File

Widget  
10  
50  
Hammer  
2  
10  
Saw  
4  
8  
etc.

| Input | Process | Output |
| --- | --- | --- |
| From file:  Item  Quantity  Price | Extended price = quantity \* price | Item  Quantity  Price  Extended price  Sum of all ext price |

1. Create a text file with student last name, district code (I or O) and number of credits taken. Compute tuition owed (credits taken x cost per credit). Cost per credit for in district students (district code I) is 250.00. Out of district students pay 500.00 per credit. For each line display student last name, credits taken and tuition owed. After the loop display sum of all tuition owed and the number of students.

Example file

Jones  
I  
12  
Adams  
I  
10  
Baker  
O  
12  
Smith  
O  
16

| Input | Process | Output |
| --- | --- | --- |
| From file:  last name  district code  credits | if statement to decide cost per credit  tuition = cost per credit \* credits  add total number of students  add total tuition owed | Last name  Credits taken  Tuition  Total number of students  Total tuition owed |