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 principle (beginning balance + interest). Display year, beginning balance and ending balance for each of the 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.

Example:

Enter principle amount: 10000.00

Enter interest rate: 0.10

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 | Enter the principle amount |  |
| rate | Enter the rate of interest |  |
| For loop | for count in range(1,6):  interest = principle \* rate  endBalance = principle + interest  Input: 10000  Input: 0.10 |  |
| Print |  | count, principle, endBalance |
|  | principle = endBalance | 1 10000.0 11000.0  2 11000.0 12100.0  3 12100.0 13310.0  4 13310.0 14641.0  5 14641.0 16105.1 |

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

1, 1, 2, 3, 5, 8 etc

Use of for loop compute and display first 20 numbers in the sequence. Hint: start with 1 , 1.

| **Input** | **Process** | **Output** |
| --- | --- | --- |
| a=1  b=0 |  |  |
| For loop | for count in range(1,25,1):  c= a+b | C |
| a = b  b = c |  | 1  1  2  3  5  8  13  21  34  55  89  144  233  377  610  987  1597  2584  4181  6765  10946  17711  28657  46368 |

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 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 lines:

Adams

50000.00

Baker

75000.00

Smith

45000.00

Etc

| **Input** | **Process** | **Output** |
| --- | --- | --- |
| last\_name | total\_bonus = 0.0  c = 0.0 |  |
| Salary | Get last\_name  While item !=“”  Get salary  Display last\_name, salary, bonus = float(salary) \* 0.10  Display Bonus | last\_name  Salary  bonus |
| total\_bonus | total\_bonus = total\_bonus + bonus  c = c + 1  Get last\_name  Display Average Bonus  avg\_bonus = total\_bonus / c | Average Bonus |
| Print |  | Employee Last Name: Adams  Employee Salary: $ 45,000.00  Employee Bonus: $ 4,500.00  Employee Last Name: Smith  Employee Salary: $ 20,000.00  Employee Bonus: $ 2,000.00  Employee Last Name: Brown  Employee Salary: $ 30,000.00  Employee Bonus: $ 3,000.00  Employee Last Name: Jones  Employee Salary: $ 20,000.00  Employee Bonus: $ 2,000.00  Average Bonus: $ 2,875.00 |

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** |
| --- | --- | --- |
| Item | C = 0  Tot ep = 0 |  |
| qty | Get item  While item !=“”  Get qty, price  Ep = qty \* price  C = c+1  Tot\_ep = tot\_ep + ep  Display item, qty, price, ep  Get next item | Item  Price  Qty  EP |
| Price | Avg = tot\_ep / c | C  Tot\_ep  avg |
| Print | Display c, tot\_ep, avg | Item is: MacBook  Quantity is: 5.0  Price is: $ 2000.0  Extended price is: $ 10000.0  Item is: iPhone  Quantity is: 1.0  Price is: $ 1000.0  Extended price is: $ 1000.0  Item is: Airpods  Quantity is: 4.0  Price is: $ 229.0  Extended price is: $ 916.0  Total extended price: $ 11916.0  Number of orders: 3.0  Average Order: 3972.0 |

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** |
| --- | --- | --- |
|  | total\_tuition = 0.0  num\_students = 0  cost\_per\_credit = 1000.00 |  |
| last\_name | while last\_name != "":  district\_code  credits\_taken |  |
| District codel | if district\_code == "I":  cost\_per\_credit = 250.00  else:  cost\_per\_credit = 500.00 | 250.00 or 500.00 |
| credits & Tuition | tuition\_owed = credits\_taken \* cost\_per\_credit  total\_tuition += tuition\_owed  num\_students += |  |
| Print | Display:  last\_name  district\_code  credits\_taken  tuition\_owed | last\_name  district\_code  credits\_taken  tuition\_owed |
| Print | Display:  total\_tuition  num\_students | total\_tuition  num\_students |
| Print |  | Student Last name: Williams  District Code: I  Credits taken: 15.0  Tuition owed: 7500.0  Student Last name: Miller  District Code: I  Credits taken: 7.0  Tuition owed: 3500.0  Student Last name: Davis  District Code: O  Credits taken: 10.0  Tuition owed: 5000.0  Student Last name: Wilson  District Code: O  Credits taken: 6.0  Tuition owed: 3000.0  Total tuition owed: $ 19000.0  Number of students: 4 |