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  Interest Rate | Set Year = 0  Set Interest Total = 0 |  |
|  | While Year < 5  Year = Year + 1  Ending = Principle \* Rate  Interest Total = Interest Total + Ending – Principle  Output  Principle = to Ending | Display Year  Display Principle  Display Ending |
|  |  | Display Interest Total |

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 |
|  | Set Number = 0  Set Fibo1 = 1  Set Fibo2 = 1  Set Fibo3 = 1 |  |
|  | While Number < 20  Number = Number + 1  Fibo3 = Fibo1  Fibo1 = Fibo1 + Fibo2  Fibo2 = Fibo3 | Display Fibo3 |

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 |
| Open Text File  Last Name  Salary | Bonus Sum = 0  Last Name = Line |  |
|  | While Last Name != “”  Salary = Line  If Salary >= 100000  Set Bonus Rate to 0.2  Else if Salary >= 50000  Set Bonus rate to 0.15  Else set Bonus Rate to 0.1  Bonus Sum = Bonus Sum + Bonus  Last Name = Line | Display Last Name  Display Salary  Display Bonus |
|  |  | Display Bonus Sum |

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 |
| Open Text File  Item  Quantity  Price | Total Price = 0  Total Quantity = 0  Item = Line |  |
|  | While Item != “”  Quantity = Line  Price = Line  Extended Price = Quantity \* Price  Total Price = Total Price + Extended Price  Total Quantity = Total Quantity + Quantity  Item = Line | Display Item  Display Quantity  Display Price  Display Extended Price |
|  | Average Price = Total Price / Total Quantity | Display Total Price  Display Total Quantity  Display Average 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 |
| Open Text File  Last Name  In or Out(State)  Credits | Tuition Total = 0  Student Total = 0  Last Name = Line |  |
|  | While Last Name != “”  State = Line  If State == I, Then Credit Cost is 250, Otherwise is 500  Credit = Line  Tuition = Credit \* Credit Cost  Tuition Total = Tuition Total + Tuition  Student Total = Student Total +1  Last Name = Line | Display Last Name  Display Credits  Display Tuition |
|  |  | Display Tuition Total  Display Student Total |