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 amount | Input principle amount  Input interest rate | Year |
| Interest rate | Beginning balance = principle amount Total interest= 0 | Beginning balance for each of the 5 years |
|  | Pirnt Year. Beginning balance. Ending balance | Accumulated interest for the 5 years |
|  | For year in range (1, 6, 1): |  |
|  | Interest = beginning balance x interest rate |  |
|  | Ending balance= beginning balance + interest  Total interest= total interest + interest |  |
|  | Pirnt Year. Beginning balance. Ending balance |  |
|  | Beginning balance = ending balance |  |
|  | Print accumulated interest for the 5 years |  |

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 |
| No input | a= 1  b= 0 | 1, 1, 2, 3, 5, 8 etc |
|  | For x in range (1, 20, 1): |  |
|  | c= a + b |  |
|  | Print (c) |  |
|  | a=b |  |
|  | b=c |  |
|  | Print 1, 1, 2, 3, 5, 8 etc |  |

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 |
| namesalary.txt | Open f= PS7P3.txt, “r” | Last name |
|  | Total sum of bonuses paid= 0 | Salary |
|  | Last name= f.readline().rstrip('\n') | bonus |
|  | While last name != “ ” | Total sum of bonuses paid. |
|  | Salary = f.readline().  Salary= float (salary) |  |
|  | If salary >= 100,000, bonus rate is 20%.  Elif salary >= 50,000, bonus rate is 15%.  Else, bonus rate is 10%. |  |
|  | Bonus = salary x bonus rate |  |
|  | Total sum of bonuses paid= total sum of bonuses paid + bonus |  |
|  | Print last name  Print salary  Print bonus |  |
|  | Last name= str(f.readline().rstrip('\n')) |  |
|  | f. close () |  |
|  | Print total sum of bonuses paid |  |

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 | Count= 0  Total extended price= 0 |  |
| Quantity | Open f= PS7P4.txt, “r” |  |
| Price | Get item  While item != “ “  Input quantity  Input price  Extended price= quantity x price  Count= count +1  Total extended price= total extended price + extend price  Print item  Print quantity  Print price  Print extended price  Get next item |  |
|  | Item  Price  Quantity  Extended price |
|  | Average = total extended price / count |  |
|  | Print count  Print total extended price  Print average | Count  Total extended price  Average order |
|  |  |  |

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 |
| Last name | Total tuition = 0  Numbers of students = 0 |  |
|  | Open f= PS7P5.txt, “r”  Get last name |  |
| District code | While last name != “ “  Get district code  Get credits |  |
| Credits | If decode = “I”  Cost per credit = 250  Else cost per credit = 500  Tuition = cost per credit x credits  Numbers of students= numbers of students + 1  Total tuition = total tuition + tuition  Print tuition  Print credits  Get last name | Last name  Credits  Tuition  Total tuition  Numbers of students |
|  | Print total tuition  Print numbers of students |  |