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 |
| Starting\_balance  interest | Total\_interest = 0 |  |
|  | For years in range 1 to 5  Annual\_interest = starting\_balance \* interest  End\_balance = starting\_balance + annual\_interest  Display years, starting\_balance, end\_balance  Starting\_balance = starting\_balance + annual\_interest  Total\_interest = total\_interest + annual\_interest | Starting\_balance  Years  End\_balance  Annual\_interest  End\_balance  Total\_interest |
|  | Display total\_interest | Total\_interest |

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 count in range 1 to 20  C = a + b  A = b  B = c  Display c | A  B  c |
|  |  |  |

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 |
|  | Total\_bonus = 0 |  |
| Name | While name != nothing  Get name, salary  If salary >= 100000:  Then bonus = .2 \* salary  Else if salary >= 50000:  Then bonus = .15 \* salary  Else:  Bonus = .1 \* salary  Display name, salary, bonus  Get next name | Name  Salary  bonus |
| salary |  |  |
|  | Display total\_bonus | Total\_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 |
|  |  |  |
| item | C = 0  Total = 0 |  |
| qty | Get item  While item is not nothing  Get qty, price  Ep = qty \* price  C = c + 1  Total = total + ep  Display item, qty, price, ep  Get next item | Item  Price  Qty  Ep  total |
| price |  |  |
|  | Avg= total / c |  |
|  | Display c, total, avg | C  Total  avg |

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 |
|  | Students = 0  Tuition = 0 |  |
| Name | While name is not nothing  Get district, credits  If district == ‘I’:  cost = 250 \* credits  Else:  cost = 500 \* credits    Students = students + 1  Tuition = tuition + cost    Display name, credit, cost  Get next name | Name  Credit  Cost  Tuition  students |
| District |  |  |
| credits |  |  |
|  | Display students, tuition | Students  tuition |