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 Balance	Ending 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	Total = 0	
rate	For x in range (1, 6, 1): annualinterest = principle * rate endingbal = principle + annualinterest total = total + annualinterest if x == 1: a1 = x b1 = principle c1 = endingbal (repeat through x==5) Principle = ending bal	Year, principle, endingbal
		total

2. 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 = 1 Display a and b	
	For x in range (1, 20, 1): C = a + b Display c A = b B = c	

3. 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
lname	Bonustotal = 0	
salary	Get lname While item !="" Get salary If salary >=100000.00 Bonusrate = 0.20 Else if salary >=50000.00 Bonusrate = 0.15 Else Bonusrate = 0.10 Bonus = salary * bonusrate Bonustotal = bonustotal + bonus Display lname, salary, bonus	Lname, salary, bonus
	Display bonustotal	bonustotal

4. 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
	Display c, tot_ep, avg	

5. 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
	Totaltuition = 0 C = 0	
lname	Get first lname	
dcode	While not at end Get dcode, credits If dcode = “I” Costpercredit = 250 Else Costpercredit = 500 Tuition = costpercredit * credits C = c + 1 Totaltuition = totaltuition + tuition Get next lname	Lname Credits Tuition c
credits		
	Display totaltuition, c	