Session 7 Assignment Problems – Looping Logic 2 and Reading Data from the Keyboard and Files

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 principal 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 amount (float)	Loop 5 times(once for every year)	Year number
Interest rate (float)	Calculate annual interest= principal x rate Calculate ending balance = principal + interest	Beginning balance
Sentinel value (to repeat/exit)	Accumulate total interest	Ending balance
	Update principal for next year= principal = ending balance	Total interest earned (after 5 years)

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
Initial values: 1,1	Initialize the first two numbers: a=1, b=1	The first 20 numbers of the fibonacci sequence
Number of terms : 20	Use a for loop to repeat the calculation	
	Calculate next number: next= a +b	
	Update variables : a=b,b= next	

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 data file (create your own data with at least 5 lines):

Adams

50000.00

Baker

75000.00

Smith

45000.00

Etc

Input	Process	Output
Employee last name (string)	Read file line by line	Employee name
Salary (float)	If salary >= 100,000: bonus =	salary

	20%	
	Else if salary >= 50,000 bonus =15%	Bonus amount
	Else: bonus 10%	Total bonuses paid (after loop)

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 name	Extended price= quantity x price	Item, qty, price
quantity(int)	Accumulate sum of extended prices	Extended price
Price (float)	Increment count of orders	Total sum
	Average order = total sum/ count	Order count and average

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
Student last name	If code = “I”; rate = 250	Student name credits taken
District code (i/o)	Else (if’0’): rate = 500	Tuition owed
Credits (int)	tuition= credits x rate	Sum of all tuition
	Accumulate total tuition and student count	Total number of students

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