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
Principal interestrate	Do you want to loop While yes accumulatedinterest = 0 beginningbalance = principal for year in range(1, 6): interest = beginningbalance * rate endingbalance = beginningbalance + interest accumulatedinterest += interest Display year, beginningbalance, interestrate beginningbalance = endingbalance Display accumulated interest Do you want to loop	Year Beginning balance Interestrate Accumulated interest

2. Display the odd numbers starting at 1 and ending with 25. Use a for this problem.

input	process	output
	For number in range 1,26 If number % 2 !=0 display number	number

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
textdocument		
	Totalbonus = 0	
	with textfile: for line in file Get lastname Get salary salary = salary	Lastname Salary Bouns totalbonuspayout

	if salary < 50000 bonusrate = 0.05 elif 50000 <= salary <= 100000 bonusrate = 0.10 else bonusrate = 0.15 bonus = salary * bonusrate totalbonus += bonus Display lastname, salary, bonusrate Display totalbonuspayout	

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 Totalep = 0	
qty	Get item While item !=”” Get qty, price	Item Price Qty

	Ep qty*price C+=1 Totalep += ep Display item, qty, price, ep Get next item	Ep
price		
	Avg = totalep/C Display C, totalep, avg	C Totalep 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

Inputs	Process	Output
	TotalTuition = 0 Count = 0	

Lastname	Get first Lastname	
DistrictCode	While not at end Get DistrictCode Get Credits If districtcode = "I" Costpercredit = 250 Else Costpercredit = 500 Tuition = costpercredit * credits C+=1 Totaltuition+=Tuition Display lastname, Credits, Tuition Get next lastname	Lastname Credits tuition
Credits		
	Display totaltuition Display Count	Totaltuition count

6. 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,b	A B
	For x in range 18 Nextnumber = a + b Display nextnumber A = b B = nextnumber	nextnumber