**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.

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| --- | --- | --- |
| **Input** | **Process** | **Output** |
| principal  interestrate  annualint=0  totint=0 | Enter the principal  Enter the interest  For year equal 1, until year less than 6  Make year equal year plus one  compute annualint by multiplying principal by interestrate  compute endbal by summing principal to annualint  totint equal to totint plus annualint  display year, principal, endbalance  make principal equal to endbalance  When x equal 5  Display totint |  |

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

principal=float(input("Enter the Principle: "))

interestrate=float(input("Enter the Interest Rate: "))

totint=0

annualint=0

print("year      Beginning Balance      End Balance")

for year in range(1,6,1):

    annualint =principal\*interestrate

    endbalance=principal+annualint

    totint=totint+annualint

    print(year, "         ", principal, "            ", endbalance)

    principal=endbalance

print("Total Interest:  ", totint)

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.

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| --- | --- | --- |
| **Input** | **Process** | **Output** |
| a=1  b=1  x=1  c=0 | For x equal 1, until x less or equal to 20  Make x equal x plus one  Make c equal to a plus b  Display a, display b, display c  Make a equal to b  Make b equal to c |  |

a=1

b=1

print(a)

print(b)

for x in range(1,20,1):

    c = a+b

    print(c)

    a=b

    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.

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| --- | --- | --- |
| **Input** | **Process** | **Output** |
| bonusrate=0 | open the file data.txt  read line one  get lastname  totalbonus=0  while lastname different from empty  get salary  if salary is greater or equal than 100000, make bonusrate equal to 0,20  if not, ask if the salary is equal to 50000, make bonusrate equal to 0,15  if not, make bonusrate equal to 0,10  compute bonus by multiplying salary by bonusrate  display lastname, bonusrate, bonus  Compute totalbonus by summing totalbonus to bonus  read next line  if salary equal “ “  display total bonus |  |

#Open the File using raw string to avoid backslash issues. This tells Python to treat backslashes as literal characters

f=open(r"c:\Users\Alba Palacio\Desktop\CYBERSECURITY\Programming fundamentals\Week 7\data.txt", "r")

#Read the first line (lastname)

lastname = str(f.readline().rstrip('\n'))  # rstrip removes the return line feed character \n from the string input so we do not process it

totalbonus=0

#Loop through the file

while lastname !="":

    salary=float(f.readline())

    if not salary:

        break #If there is no Salary the program break

    #Determine the Bonus Rate

    if salary >= 100000:

        bonusrate=0.20

    else:

        if salary == 50000:

            bonusrate=0.15

        else:

            bonusrate=0.10

    #Calculate Bonus

    bonus=salary\*bonusrate

    totalbonus=totalbonus+bonus

    print("The Lastname is: ", lastname)

    print("The Bonus Rate is: ", bonusrate)

    print(f"The Bonus is: ${bonus:.2f}")

    print ()

    #Read the next lastname

    lastname=str(f.readline().strip('\n'))

f.close()

#when the cycle ends print the last variable

print("The sum of all bonuses paid out is: ", totalbonus)

bSalary Bonus Rate

100,000.00 and up 20%

50,000.00 15%

All other salaries 10%

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.

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| --- | --- | --- |
| **Input** | **Process** | **Output** |
| Item  Qty  price | open the file item.txt  Make count equal zero  Make totextpri equal zero  read line one  get item  while item different from empty  get qty and price  compute extprice by multiplying qty by price  compute count by summing count plus one  compute totextpri by summing totextpri to extprice  display item, qty, price, extprice  get next item | item  qty  price  extprice |
|  | Compute average by dividing totextpri by count  Display count, totextpri and average | Count  totextpri  average |

f=open(r"c:\Users\Alba Palacio\Desktop\CYBERSECURITY\Programming fundamentals\Week 7\item.txt", "r")

#Read the first line (item)

item = (f.readline().rstrip('\n'))  # rstrip removes the return line feed character \n from the string input so we do not process it

count=0

toextpri=0

#Loop through the file

while item !="":

    qty=float(f.readline())

    price=float(f.readline())

    if not price:

        break #If there is no Salary the program break

    #Determine the Extended Price

    extprice=qty\*price

    count=count+1

    toextpri=toextpri+extprice

    print("The Item is: ", item)

    print("Cantidad: ", qty)

    print("The Price is: ", price)

    print("The Extended Price is: ", extprice)

    print()

#Read the next lastname

    item=str(f.readline().strip('\n'))

f.close()

#Final Calculations

average=toextpri/count

print("The sum of all the extended prices is: ", toextpri)

print("The count of the number of orders is:", count)

print("The average order is: ", average)

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.

|  |  |  |  |
| --- | --- | --- | --- |
| **Input** | **Process** |  | **Output** |
| lastname  district  numcred | open the file student.txt  read line one  Make tottuition equal zero  Make count equal zero  while lastname different from empty  get district and numcred  if numcred equal empty, then break  else  if district equal I, make costpercredit equal to 250.00  if not  if district equal O, make costpercredit equal to 500.00  compute tuition by multiplying numcred by costpercredit  compute tottuition by summing tuition to tottuition  display lastname, numcred, tuition  get next lastname |  | studentlastname  numcred  tuition |
|  | Display tottuition |  | tottuition |

f=open(r"c:\Users\Alba Palacio\Desktop\CYBERSECURITY\Programming fundamentals\Week 7\student.txt", "r")

#Read the first line (lastname)

lastname = (f.readline().rstrip('\n'))  # rstrip removes the return line feed character \n from the string input so we do not process it

count=0

tottuition=0

#Loop through the file

while lastname !="":

    district=(f.readline().rstrip('\n'))

    numcred=float(f.readline())

    if not numcred:

        break #If there is no Salary the program break

        #Determine the Cost per Credit

    if district == 'I':

        costpercredit=250

    else:

        if district == 'O':

            costpercredit=500

    #Determine the Tuition

    tuition=numcred\*costpercredit

    tottuition=tottuition+tuition

    count=count+1

    #Impresion

    print("Student Las Name:", lastname)

    print("Credits Taken: ", numcred)

    print("The Tuition is: ", tuition)

    print()

    #Read the next lastname

    lastname=str(f.readline().strip('\n'))

f.close()

#when the cycle ends print the last variables

print("The sum of all Tutitions is: ", tottuition)

print("The Number of Students is: ", count)