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Computer Science 1-INT 2210

Lab Assignment #1

Dr. Homer Sharafi

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**Solution to Lab Assignment #1**

I have named this program, bank payment program. This program calculates the compounded interest made by a customer’s bank account after a specified number of years. The idea here stems from the fact that the bank pays interest on the principal amount that was originally deposited as well as on the interest that has accumulated over time.

For my program to determine how much money the customer has accumulated over the years, the program will be constituted of input, processing and output:

**Input data:** principal amount, interest rate, annual compounded interest frequency, specified number of years.

**Output data:** output String, account balance, principal amount, interest rate, specified number of years, annual compounded interest frequency.

**Processing data:**

accountBalance=principalAmount\*(1+((interestRate/100)/annualCompoundedInterestFrequency)); //first part of the formula A=P(1+rn)

power=Math.pow(accountBalance,(annualCompoundedInterestFrequency\*specifiedNumberOfYears)); //second part of the formula that does the exponential function (raises the value of A to nt: (A)^nt)

**Bank Payment Program (written in java)**

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\* this program was written by Edward Kuisseu Tatchim on 09/13/2018

\*/

/\*\*this program calculates the balance

\* of an account after a certain number of years.

\*/

import javax.swing.JOptionPane; //this line calls the JOptionPane library to be used in the bankPaymentProgram

import java.lang.Math; //this line calls the library of Math functions

public class bankPaymentProgram {

public static void main(String[] args) { //auto-generated main method.

/\*\*

\* This section of the program declares all the variables used.

\*/

double principalAmount=0.0; //the amount of money originally deposited into the account

double interestRate; //annual interest rate paid by the account

int annualCompoundedInterestFrequency; //number of times per year that the interest is compounded

int specifiedNumberOfYears; //number of years the account will be left to earn interest

double accountBalance; //User's account balance after a specified amount of years

double power;

String outputString=""; // for reading input

/\*\*

\* This is section of the program communicates with the customer to get all his/her input

\*/

outputString=JOptionPane.showInputDialog("What was your originally deposited amount?");

principalAmount=Double.parseDouble(outputString);

JOptionPane.showMessageDialog(null,"You initially had " + " " +principalAmount + " " +"deposited on your account");

outputString=JOptionPane.showInputDialog("Dear customer, enter the interest rate as percentage that you get paid by the account (e.g. 25, 67, 1100111150 etc..)");

interestRate=Double.parseDouble(outputString);

JOptionPane.showMessageDialog(null,"Your account pays an interest of : " + " " + interestRate + "%");

outputString=JOptionPane.showInputDialog("How many times per year is your interest rate compounded? if compounded monthly: enter 12. If compounded quarterly: enter 4. etc...)");

annualCompoundedInterestFrequency=Integer.parseInt(outputString);

JOptionPane.showMessageDialog(null, "Your interest rate is compounded" + " " + annualCompoundedInterestFrequency + " " + "times a year");

outputString=JOptionPane.showInputDialog("For how many years will you leave this account to earn interest? ");

specifiedNumberOfYears=Integer.parseInt(outputString);

JOptionPane.showMessageDialog(null,"You will leave this account to earn interest for " + specifiedNumberOfYears + " " + "years");

/\*\*

\* This section of the program does the calculation proper. It uses all input data to perform Arithmetic and Logical Operations

\* This process is aided by the computer's Control Unit in the background

\*/

accountBalance=principalAmount\*(1+((interestRate/100)/annualCompoundedInterestFrequency)); //first part of the formula A=P(1+rn)

power=Math.pow(accountBalance,(annualCompoundedInterestFrequency\*specifiedNumberOfYears)); //second part of the formula that does the exponential function (raises the value of A to nt: (A)^nt)

/\*\*

\* This section of the program is the output of all the calculations. It outputs the customer's account balance after x-years of accumulated interest

\*/

JOptionPane.showMessageDialog(null, "There will be" + " " + accountBalance + " " + "dollars in your account after" + " " + specifiedNumberOfYears +" "+ "years");

System.exit(0);

}

}