Christopher Bussen

CPS 150 02 – Algorithms and Programming 1

Lab 5

9/8/20

**Program 1 Running Screenshot**

**A screenshot of a computer

Description automatically generated**

**Program 1 Code**

\*\*Algorithm can be seen in Class Activity 3

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Lab 5

BalloonVolume: number; number number number – I added original volume as an output

program takes in an original diameter of balloon from the user and outputs

the new volumes if the balloon's diameter increases by 1 or 2 inches

Volume of sphere = (4/3)π(diameter/2)^3

ex1: user inputs 4 - program outputs 33.510, 65.449, 113.097

ex2: user inputs 8.64 - program outputs 337.706, 469.061, 630.700

ex3: user inputs - 64.89 - program outputs 143064.520, 149781.144, 156704.767

ex4: user inputs three - program outputs error

ex5: user inputs -10.40 - program outputs -588.977, -434.892, -310.339

\*/

import java.util.Scanner;

public class BalloonVolume {

public static void main(String [] args){

//Import Scanner

Scanner input = new Scanner(System.in);

//Prompt the user to input a value for the diameter of the balloon

System.out.print("Enter the diameter of the balloon: ");

//Declare a double variable to store the value of the diameter that the user enters

double firstDiameter = input.nextDouble();

//Declare a double variable to store the volume of the sphere using the original diameter

double firstVolume = 4 \* Math.PI \* Math.pow((firstDiameter/2), 3) / 3;

//Print the original volume

System.out.println("The original volume is: " + firstVolume);

//Declare a double variable to store the value of the input diameter plus 1

double secondDiameter = firstDiameter + 1;

//Declare a double variable to store the volume of the sphere using the diameter plus 1

double secondVolume = 4 \* Math.PI \* Math.pow((secondDiameter/2), 3) / 3;

//Print the new volume

System.out.println("The second volume is: " + secondVolume);

//Declare a double variable to store the value of the input diameter plus 2

double thirdDiameter = firstDiameter + 2;

//Declare a double variable to store the volume of the sphere using the diameter plus 2

double thirdVolume = 4 \* Math.PI \* Math.pow((thirdDiameter/2), 3) / 3;

// Print the volume of the sphere using the diameter plus 2

System.out.println("The final volume is: " + thirdVolume);

}

}

**Program 2 Running Screenshot**

**A screenshot of a computer

Description automatically generated**

**Program 2 Code**

\*\*Algorithm can be seen in Class Activity 3

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Lab 5

FredsBank: number number; number

program takes in the original balance in bank account and number of vacation months

and calculates total monthly fees and interest and adds at to balance to output a total

balance

ex1: user inputs 100, 4 - program outputs 80.370

ex2: user inputs 10645.2, 2 - program outputs 10656.496

ex3: user inputs - 100000, 2.6 - program outputs error

ex4: user inputs six - program outputs error

ex5: user inputs -1000.40, 1 - program outputs -1006.400

\*/

import java.util.Scanner;

public class FredsBank {

public static void main(String [] args){

//Import scanner

Scanner input = new Scanner(System.in);

//Prompt the user to input a value for the current balance in the account

System.out.print("Enter the current balance: $");

//Declare a double variable to store the value of the user’s current balance

double balance = input.nextDouble();

//Prompt the user to input a value for the number of vacation months

System.out.print("Enter the number of months on vacation: ");

//Declare an int variable to store the value of vacation months the user enters

int vacationMonths = input.nextInt();

//Declare a double variable for the interest rate of the account

double interestRate = 0.1;

//Declare a double variable for the bank’s monthly maintenance fee

double monthlyFee = 5.0;

//Repeat process of gaining interest and paying fees for the amount of vacation months - use for loop

//Declare int i to be the variable that controls the for loop

int i = 0;

for(i = 0; i < vacationMonths; i++) {

//Declare a double variable for the amount of interest accrued each month

double interest = balance \* (interestRate / 100);

//Reassign the variable for current balance the value of the old balance minus monthly fees plus interest

balance = balance - monthlyFee + interest;

}

//Print out the final balance after the amount of vacation months

System.out.println("Your balance after " + vacationMonths + " months will be: $" + balance);

}

}