**Assignment 4**

1.Loan

Soln--**package** org.example;

**import** java.util.Scanner;

**class** Loan {

**private** **double** principal;

**private** **double** rate;

**private** **int** term;

**public** **double** getPrincipal() {

**return** principal;

}

**public** **void** setPrincipal(**double** principal) {

**this**.principal = principal;

}

**public** **double** getRate() {

**return** rate;

}

**public** **void** setRate(**double** rate) {

**this**.rate = rate;

}

**public** **int** getTerm() {

**return** term;

}

**public** **void** setTerm(**int** term) {

**this**.term = term;

}

**public** **void** acceptRecord() {

Scanner sc = **new** Scanner(System.***in***);

System.***out***.println("Enter the principal amount:");

setPrincipal(sc.nextDouble());

System.***out***.println("Enter the rate:");

setRate(sc.nextDouble());

System.***out***.println("Enter the term in years:");

setTerm(sc.nextInt());

}

**public** **double** calculate() {

**double** ase = term \* 12;

rate = rate / 12;

**double** numerator = rate \* Math.*pow*((1 + rate), ase);

**double** denominator = Math.*pow*((1 + rate), ase) - 1;

**return** principal \* (numerator / denominator);

}

**public** **void** printRecord() {

**double** amt = calculate();

System.***out***.println("Amount is " + amt);

}

}

**class** LoanUtil {

**public** **void** processLoan() {

Loan loan = **new** Loan();

loan.acceptRecord();

loan.printRecord();

}

}

**public** **class** Prog\_1 {

**public** **static** **void** main(String[] args) {

LoanUtil loanutil = **new** LoanUtil();

loanutil.processLoan();

}

}

2. Compound Interest

Soln— package org.example;

import java.util.Scanner;

class Loan {

private double principal;

private double rate;

private int timesCompounded;

private double term;

// Getters and Setters

public double getPrincipal() {

return principal;

}

public void setPrincipal(double principal) {

this.principal = principal;

}

public double getRate() {

return rate;

}

public void setRate(double rate) {

this.rate = rate;

}

public int getTimesCompounded() {

return timesCompounded;

}

public void setTimesCompounded(int timesCompounded) {

this.timesCompounded = timesCompounded;

}

public double getTerm() {

return term;

}

public void setTerm(double term) {

this.term = term;

}

public void acceptRecord() {

Scanner sc = new Scanner(System.in);

System.out.println("Enter the principal amount:");

setPrincipal(sc.nextDouble());

System.out.println("Enter the annual interest rate (in decimal form, e.g., 0.05 for 5%):");

setRate(sc.nextDouble());

System.out.println("Enter the number of times interest is compounded per year:");

setTimesCompounded(sc.nextInt());

System.out.println("Enter the term in years:");

setTerm(sc.nextDouble());

}

public double calculateFutureValue() {

double futureValue = principal \* Math.pow((1 + rate / timesCompounded), timesCompounded \* term);

return futureValue;

}

public double calculateTotalInterest() {

double futureValue = calculateFutureValue();

return futureValue - principal;

}

public void printRecord() {

double futureValue = calculateFutureValue();

double totalInterest = calculateTotalInterest();

System.out.println("Future Value: " + futureValue);

System.out.println("Total Interest: " + totalInterest);

}

}

class LoanUtil {

public void processLoan() {

Loan loan = new Loan();

loan.acceptRecord();

loan.printRecord();

}

}

public class Prog\_1 {

public static void main(String[] args) {

LoanUtil loanutil = new LoanUtil();

loanutil.processLoan();

}

}

3.BMI

Soln-- **package** org.example;

import java.util.Scanner;

class BMI {

private float weight;

private float height;

public void acceptInput() {

Scanner sc = new Scanner(System.in);

System.out.print("Enter height in meters: ");

setHeight(sc.nextFloat());

System.out.print("Enter weight in kilograms: ");

setWeight(sc.nextFloat());

}

public void setWeight(float weight) {

this.weight = weight;

}

public void setHeight(float height) {

this.height = height;

}

public float calculateBMI() {

return weight / (height \* height);

}

public void displayResults() {

float bmi = calculateBMI();

System.out.println("BMI: " + bmi);

if (bmi < 18.5) {

System.out.println("Category: Underweight");

} else if (bmi >= 18.5 && bmi < 24.9) {

System.out.println("Category: Normal weight");

} else if (bmi >= 25 && bmi < 29.9) {

System.out.println("Category: Overweight");

} else {

System.out.println("Category: Obese");

}

}

}

class BMIManager {

public void processBMI() {

BMI bmiCalculator = new BMI();

bmiCalculator.acceptInput();

bmiCalculator.displayResults();

}

}

public class BMICalculatorApp {

public static void main(String[] args) {

BMIManager manager = new BMIManager();

manager.processBMI();

}

}

4. Discount Price

Soln--

import java.util.Scanner;

class Retail {

private double originalPrice;

private double discountRate;

public void acceptRecord() {

Scanner sc = new Scanner(System.in);

System.out.println("Enter the original price:");

setOriginalPrice(sc.nextDouble());

System.out.println("Enter the discount rate (in percentage):");

setDiscountRate(sc.nextDouble());

}

public void setOriginalPrice(double originalPrice) {

this.originalPrice = originalPrice;

}

public void setDiscountRate(double discountRate) {

this.discountRate = discountRate;

}

public double calculateDiscount() {

return originalPrice \* (discountRate / 100);

}

public double calculateFinalPrice() {

return originalPrice - calculateDiscount();

}

public void printRecord() {

double discountAmount = calculateDiscount();

double finalPrice = calculateFinalPrice();

System.out.println("Discount Amount: " + discountAmount);

System.out.println("Final Price: " + finalPrice);

}

}

class RetailUtil {

public void processRetail() {

Retail retail = new Retail();

retail.acceptRecord();

retail.printRecord();

}

}

public class RetailApp {

public static void main(String[] args) {

RetailUtil retailUtil = new RetailUtil();

retailUtil.processRetail();

}

}

5. Total revenue from Vehicles

Soln-- **package** org.example;

import java.util.Scanner;

class Toll {

private int carCount;

private int truckCount;

private int bikeCount;

private double carRate;

private double truckRate;

private double bikeRate;

public void acceptRecord() {

Scanner sc = new Scanner(System.in);

System.out.println("Enter the number of Cars:");

setCarCount(sc.nextInt());

System.out.println("Enter the number of Trucks:");

setTruckCount(sc.nextInt());

System.out.println("Enter the number of Bikes:");

setBikeCount(sc.nextInt());

System.out.println("Enter the rate for Cars:");

setCarRate(sc.nextDouble());

System.out.println("Enter the rate for Trucks:");

setTruckRate(sc.nextDouble());

System.out.println("Enter the rate for Bikes:");

setBikeRate(sc.nextDouble());

}

public void setCarCount(int carCount) {

this.carCount = carCount;

}

public void setTruckCount(int truckCount) {

this.truckCount = truckCount;

}

public void setBikeCount(int bikeCount) {

this.bikeCount = bikeCount;

}

public void setCarRate(double carRate) {

this.carRate = carRate;

}

public void setTruckRate(double truckRate) {

this.truckRate = truckRate;

}

public void setBikeRate(double bikeRate) {

this.bikeRate = bikeRate;

}

public int calculateTotalVehicles() {

return carCount + truckCount + bikeCount;

}

public double calculateTotalRevenue() {

return (carCount \* carRate) + (truckCount \* truckRate) + (bikeCount \* bikeRate);

}

public void printRecord() {

int totalVehicles = calculateTotalVehicles();

double totalRevenue = calculateTotalRevenue();

System.out.println("Total Vehicles: " + totalVehicles);

System.out.println("Total Revenue: " + totalRevenue);

}

}

class TollUtil {

public void processToll() {

Toll toll = new Toll();

toll.acceptRecord();

toll.printRecord();

}

}

public class TollApp {

public static void main(String[] args) {

TollUtil tollUtil = new TollUtil();

tollUtil.processToll();

}

}