**ASSIGNMENT 4**

package com.example;

import java.util.Scanner;

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• The assignment is designed to practice constructor, getter/setter and toString method.

1. Loan Amortization Calculator

Implement a system to calculate and display the monthly payments for a mortgage loan.

The system should:

1. Accept the principal amount (loan amount), annual interest rate, and loan term (in years)

from the user.

2. Calculate the monthly payment using the standard mortgage formula:

o Monthly Payment Calculation:

♣ monthlyPayment = principal \* (monthlyInterestRate \* (1 + monthlyInterestRate)^(numberOfMonths))

/ ((1 + monthlyInterestRate)^(numberOfMonths) - 1)

♣ Where monthlyInterestRate = annualInterestRate / 12 / 100 and

numberOfMonths = loanTerm \* 12

♣ Note: Here ^ means power and to find it you can use Math.pow( ) method

3. Display the monthly payment and the total amount paid over the life of the loan,

in Indian Rupees (₹).

Define the class LoanAmortizationCalculator with fields,

an appropriate constructor,

getter and

setter methods, a toString method and business logic methods.

Define the class LoanAmortizationCalculatorUtil with methods acceptRecord, printRecord, and

menuList. Define the class Program with a main method and test the functionality of the utility

class.

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class LoanAmortizationCalculator{

private int principle\_amount;

private float interest\_rate;

private float loan\_term;

public LoanAmortizationCalculator() {

}

public LoanAmortizationCalculator(int principle\_amount, float interest\_rate, float loan\_term) {

this.principle\_amount = principle\_amount;

this.interest\_rate = interest\_rate;

this.loan\_term = loan\_term;

}

public int getPrinciple\_amount() {

return principle\_amount;

}

public void setPrinciple\_amount(int principle\_amount) {

this.principle\_amount = principle\_amount;

}

public float getInterest\_rate() {

return interest\_rate;

}

public void setInterest\_rate(float interest\_rate) {

this.interest\_rate = interest\_rate;

}

public float getLoan\_term() {

return loan\_term;

}

public void setLoan\_term(float loan\_term) {

this.loan\_term = loan\_term;

}

public void acceptRecord() {

// TODO Auto-generated method stub

}

public void printRrcord() {

// TODO Auto-generated method stub

}

public double calculateMonthlyPayment() {

double monthlyInterestRate = (interest\_rate / 12) / 100;

double numberOfMonths = loan\_term \* 12;

double monthlyPayment = principle\_amount \* (monthlyInterestRate \* Math.*pow*(1 + monthlyInterestRate, numberOfMonths))

/ (Math.*pow*(1 + monthlyInterestRate, numberOfMonths) - 1);

System.*out*.println( "monthly payment :" + monthlyPayment);

return monthlyPayment;

}

public double calculateAnnualPayment() {

double calculateMonthly = calculateMonthlyPayment();

double numberOfMonths = loan\_term \* 12;

double annualPayment = numberOfMonths \* calculateMonthly ;

System.*out*.println(annualPayment);

return annualPayment;

}

}

class LoanAmortizationCalculatorUtil{

LoanAmortizationCalculator lc=new LoanAmortizationCalculator();

void acceptRecord() {

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

System.*out*.println("enter the principle amount:");

int principle=sc.nextInt();

lc.setPrinciple\_amount(principle);

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

float interest\_rate=sc.nextFloat();

lc.setInterest\_rate(interest\_rate);

System.*out*.println("enter tha loan term:");

float loan\_term=sc.nextFloat();

lc.setLoan\_term(loan\_term);

System.*out*.println();

//appMenuList();

}

void printRecord() {

System.*out*.println("principle amount is:" + lc.getPrinciple\_amount());

System.*out*.println("interest rate is:" + lc.getInterest\_rate());

System.*out*.println("loan term is:"+ lc.getLoan\_term());

}

void appMenuList() {

System.*out*.println("1. Display Record");

System.*out*.println("2. Accept Records");

System.*out*.println("3. Monthly Payment");

System.*out*.println("4. Yearly Payment");

System.*out*.println("5. exit");

System.*out*.println();

System.*out*.println("Please enter number to proceed");

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

int choise = scanner.nextInt();

switch(choise) {

case 1 :

printRecord();

appMenuList();

break;

case 2 :

acceptRecord();

appMenuList();

break;

case 3 :

lc.calculateMonthlyPayment();

appMenuList();

break;

case 4 :

lc.calculateAnnualPayment();

appMenuList();

break;

case 5:

System.*out*.println("exiting");

break;

default :

System.*out*.println("please enter valid choise");

appMenuList();

break;

}

}

}

public class Test {

public static void main(String[] args) {

System.*out*.println("Welcomen to CDAC Loan calculator");

System.*out*.println();

LoanAmortizationCalculatorUtil amortizationCalculatorUtil = new LoanAmortizationCalculatorUtil();

amortizationCalculatorUtil.appMenuList();

}

}

**package** com.cdac;

**import** java.util.Scanner;

/\*

2. Compound Interest Calculator for Investment

Develop a system to compute the future value of an investment with compound interest.

The system should:

1. Accept the initial investment amount, annual interest rate,

number of times the interest is compounded per year, and investment duration (in years)

from the user.

2. Calculate the future value of the investment using the formula:

o Future Value Calculation:

♣ futureValue = principal \* (1 + annualInterestRate / numberOfCompounds)^(numberOfCompounds \* years)

o Total Interest Earned: totalInterest = futureValue - principal

3. Display the future value and the total interest earned, in Indian Rupees (₹).

Define the class CompoundInterestCalculator with fields,

an appropriate constructor, getter and setter methods,

a toString method and business logic methods.

Define the class CompoundInterestCalculatorUtil with methods acceptRecord, printRecord, and menuList. Define the class Program with a main method to test the functionality of the utility class.

\*/

**class** CompundInterestCalculator {

**private** **int** initial\_investment\_amount;

**private** **float** interest\_rate;

**private** **float** no\_of\_times\_componded;

**private** **float** investment\_duration;

**double** futureValue;

**double** totalInterest;

**public** **int** getInitial\_investment\_amount() {

**return** initial\_investment\_amount;

}

**public** **void** setInitial\_investment\_amount(**int** initial\_investment\_amount) {

**this**.initial\_investment\_amount = initial\_investment\_amount;

}

**public** **float** getInterest\_rate() {

**return** interest\_rate;

}

**public** **void** setInterest\_rate(**float** interest\_rate) {

**this**.interest\_rate = interest\_rate;

}

**public** **float** getNo\_of\_times\_componded() {

**return** no\_of\_times\_componded;

}

**public** **void** setNo\_of\_times\_componded(**float** no\_of\_times\_componded) {

**this**.no\_of\_times\_componded = no\_of\_times\_componded;

}

**public** **float** getInvestment\_duration() {

**return** investment\_duration;

}

**public** **void** setInvestment\_duration(**float** investment\_duration) {

**this**.investment\_duration = investment\_duration;

}

**public** CompundInterestCalculator() {

}

**void** futureValue() {

futureValue = initial\_investment\_amount

\* Math.*pow*((1 + interest\_rate / no\_of\_times\_componded), (no\_of\_times\_componded \* investment\_duration));

System.***out***.println(futureValue);

}

**void** totalInterest() {

totalInterest = futureValue - initial\_investment\_amount;

System.***out***.println(totalInterest);

}

}

**class** CompoundInterestCalculatorUti {

CompundInterestCalculator compoundinterestcal = **new** CompundInterestCalculator();

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

**void** acceptRecord() {

System.***out***.println("enter the initial investment:");

**int** principle = sc.nextInt();

compoundinterestcal.setInitial\_investment\_amount(principle);

System.***out***.println("enter interest rate");

**float** rate = sc.nextFloat();

compoundinterestcal.setInterest\_rate(rate);

System.***out***.println("enter the no of times compounded");

**float** time = sc.nextFloat();

compoundinterestcal.setNo\_of\_times\_componded(time);

System.***out***.println("enter the duration:");

**float** duration = sc.nextFloat();

compoundinterestcal.setInvestment\_duration(duration);

}

**void** printRecord()

{

System.***out***.println("principle is:" + compoundinterestcal.getInitial\_investment\_amount());

System.***out***.println("interest rate is:" + compoundinterestcal.getInterest\_rate());

System.***out***.println("no of times compounede is:" + compoundinterestcal.getNo\_of\_times\_componded());

System.***out***.println("the duration is :" + compoundinterestcal.getInvestment\_duration());

}

**void** menuList() {

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

System.***out***.println("1.Accept Record ");

System.***out***.println("2.Print Record ");

System.***out***.println("3.Know Future value ");

System.***out***.println("4.Interest earned");

System.***out***.println("5.exit");

System.***out***.println("enter the choice");

**int** choice = sc.nextInt();

**switch** (choice) {

**case** 1:

acceptRecord();

menuList();

**break**;

**case** 2:

printRecord();

menuList();

**break**;

**case** 3:

compoundinterestcal.futureValue();

menuList();

**break**;

**case** 4:

compoundinterestcal.totalInterest();

menuList();

**break**;

**case** 5:

System.***out***.println("exiting");

**break**;

**default**:

System.***out***.println("enter the valid choice:");

**break**;

}

}

}

**public** **class** Test {

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

System.***out***.println("Welcome to cdac compound interest calculator:");

CompoundInterestCalculatorUti cti = **new** CompoundInterestCalculatorUti();

cti.menuList();

}

}