CS209 Lab03B
fa2014
dutta/streller

PROBLEM STATEMENT:

This lab exercise is a continuation of Lab Exercise 3A.
Extend your Lab 3-A program. You will modify and extend your Lab 3A program as described in the following steps.

CODE :

Extend the program. Now you will modify and extend the program as described in the following steps.

Modification One.

Modify the calculatePayment method. Modify the code for the method named calculatePayment so that it meets the following specifications: The calculatePayment method must:
Take four parameters as input: (1) property cost (type double), (2) down payment (type double), and (3) number of years (integer), and (4) type of property (type char).
Return a result of type double, namely the calculated payment for the month.
This method does not actually calculate the payment, but instead calls the appropriate method depending on the type of property. The payment is computed by the called method as described in the next numbered item below.
Depending on the type of property, the calculatePayment method must call the correct method to compute the payment for the property:

If the property is Residential, call the method named computeResidentialPayment. Pass the cost, down payment, and number of years to this method.
If the property is Commercial, call the method named computeCommercialPayment. Pass the cost, down payment, and number of years to this method.
If the property is Agricultural, call the method named computeAgriculturalPayment. Pass cost, down payment, and number of years to this called method.

Modification Two. Implement the method for Residential payment calculation: Write the code for the method named computeResidentialPayment. Place this method definition code below the main method of the existing program class. This method must:
Include modifier static in the method header.
Take two parameters of type double: (1) cost and (2) down payment; One parameter type integer: number of years.
Return a result of type double, namely the calculated payment for the month.
The residential annual interest rate is currently 5.75%. However, if the down payment is less than 20% of the cost, the residential interest rate is 6.75%
Declare a local variable annual interest rate and assign the appropriate interest rate.
Calculate payment by calling the computeMonthlyPayment method. Pass the loan amount, the annual interest rate, and the number of years to this method.

Modification Three. Implement the method for Commercial payment calculation: Write the code for the method named computeCommercialPayment. Place this method definition code below the main method of the existing program class. This method must:
Include modifier static in the method header.
Take two parameters of type double: (1) cost and (2) down payment. One parameter type integer: number of years.
Return a result of type double, namely the calculated payment for the month.
The commercial annual interest rate is currently 8.6%. However, if the down payment is less than 30% of the cost, the residential interest rate is 9.6%
Declare a local variable annual interest rate and assign the appropriate interest rate.
Calculate payment by calling the computeMonthlyPayment method. Pass

the loan amount, the annual interest rate, and the number of years to this method.

Modification Four Implement the method for Agricultural payment calculation: Write the code for the method named computeAgriculturalPayment. Place this method definition code below the main method of the existing program class. This method must:

Include modifier static in the method header.
Take two parameters of type double: (1) cost and (2) down payment. One parameter type integer: number of years.
Return a result of type double, namely the calculated payment for the month.
The Agricultural annual interest rate is 5.25%. However , if the down payment is less than 10% of the cost, the agricultural interest rate is 6.25%.
Declare a local variable annual interest rate and assign the appropriate interest rate.
Calculate payment by calling the computeMonthlyPayment method. Pass the loan amount, the annual interest rate, and the number of years to this method.

Modification Fine Implement the method for computing the monthly payment. Write the code for the method computeMonthlyPayment method. The formula is in the original code given and should have been commented out in part A of this lab. Just in case:

```
// Calculate monthly payment
// Change the annual interest rate to a decimal (/100) and a monthly rate (/12)
  monthlyPayment = loanAmount * (annualInterestRate/1200) /
                       (1 - 1 / Math.pow(1 + (annualInterestRate/1200), numberOfYears * 12));
```

This method has parameters for loan amount, the annual interest rate, and the number of years to this method. The method returns the monthlyPayment.

Modification Six Implement the method for computing the total amount that is paid to the lender for the loan. This method computeTotalPayment has parameters monthly payment and number of years. The total amount paid is returned.

Modification Seven Display information on all properties. Your program must display all the information on all the properties, one property per two lines. For each property, the displayed information must include the following on one line, with each item labeled:

The cost of the property.
The type of property (Residential, Commercial, Agricultural).
The calculated monthly payment (which depends on the type of property).
The total amount paid back for the loan.

Modification Eight Continue to display all the information on all properties during each pass through loop. The program must continue to display the output string in a JOptionPane popup dialog window during each pass through the loop. The information on each property must include the property type, cost, loan amount, number of years, computed payment, and total amount paid. The output display must include the formatting as specified in Lab 3-A, and the full name of the property type as in Lab 3-A. The number of lines will grow as additional properties are added by the user.

Reformat the program code: Reformat the Java code so that it has proper indentation and vertical and horizontal alignment:

Recompile, test, and debug your program. Test your program using a sufficient variety of data to make sure that it works on all cases.

As usual create ReadMe.pdf file.
Create a file named ReadMe.pdf
In this document, insert your name at the top, and on the next line insert the assignment number
Then enter any comments regarding the assignment and your program.
Then insert several window captures of windows showing the inputs and outputs from the execution of the program.
Be sure the ReadMe file is within your top level project folder.

Zip the project folder and all its contents.
Change the name the zip file so that its name consists of your name along with the assignment number, as follows: " LastName_ Lab_03A_cs209.zip".
Do not use spaces in the name of the file, use underscores or hyphens instead.

<u>Deliverables:</u>

Send to streller@ecc.edu an email this the exact subject

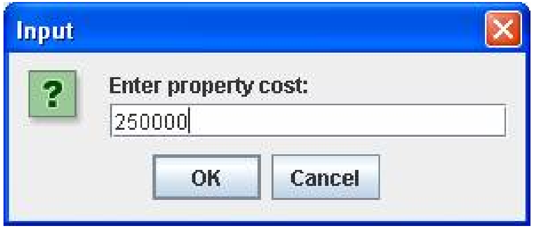
cs209__ Lab_03B

In this email attached the above named zip file

LastName_ Lab_03A_cs209.zip

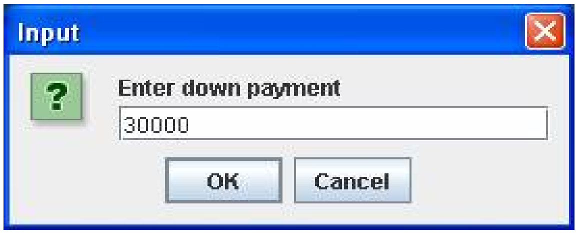
Due Date : 5:00pm 25 September 2014

Example window captures for the completed working program below:



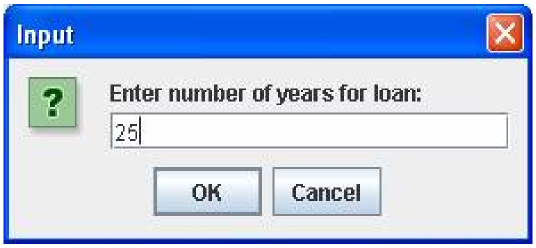
Enter property cost:

250000



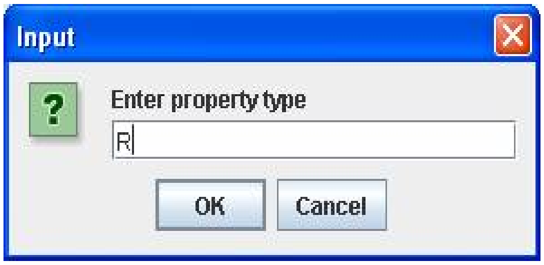
Enter down payment

30000



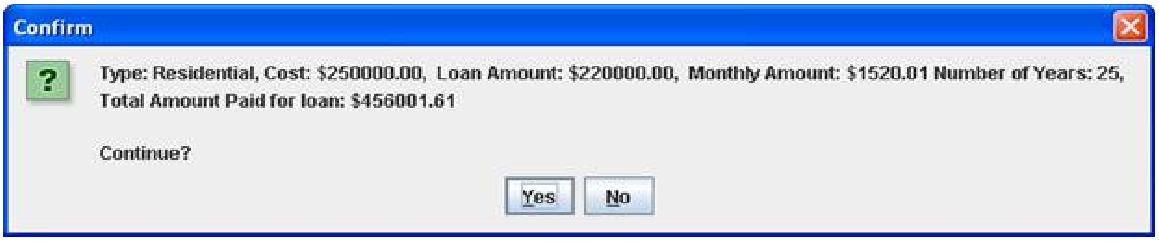
Enter number of years for loan:

25



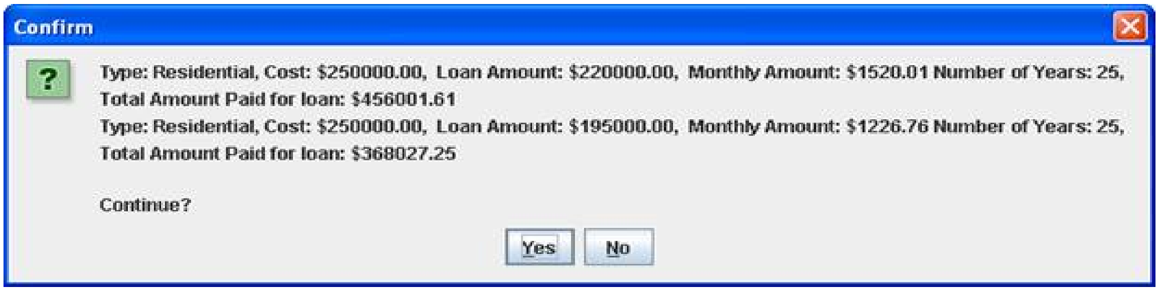
Enter property type

R



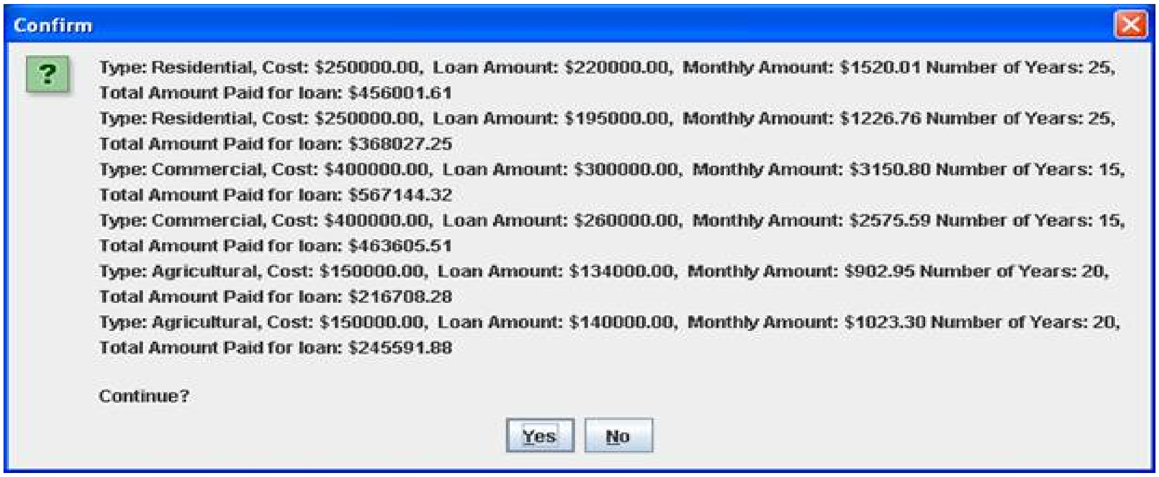
```
Type: Residential, Cost: $250000.00,  Loan Amount: $220000.00,  Monthly Amount: $1520.01 Number of Years: 25,
Total Amount Paid for loan: $456001.61

Continue?
```



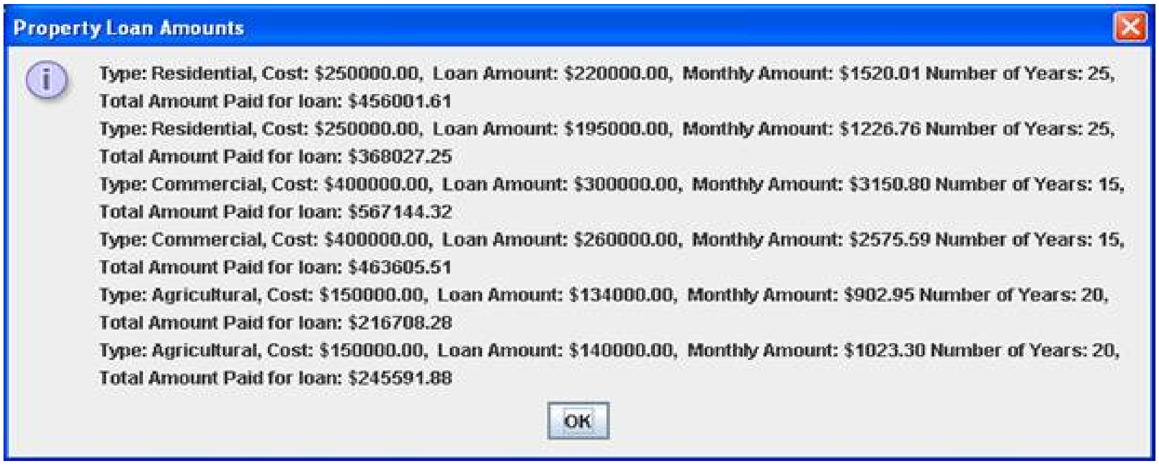
```
Type: Residential, Cost: $250000.00,  Loan Amount: $220000.00,  Monthly Amount: $1520.01 Number of Years: 25,
Total Amount Paid for loan: $456001.61
Type: Residential, Cost: $250000.00,  Loan Amount: $195000.00,  Monthly Amount: $1226.76 Number of Years: 25,
Total Amount Paid for loan: $368027.25

Continue?
```



```
Type: Residential, Cost: $250000.00,  Loan Amount: $220000.00,  Monthly Amount: $1520.01 Number of Years: 25,
Total Amount Paid for loan: $456001.61
Type: Residential, Cost: $250000.00,  Loan Amount: $195000.00,  Monthly Amount: $1226.76 Number of Years: 25,
Total Amount Paid for loan: $368027.25
Type: Commercial, Cost: $400000.00,  Loan Amount: $300000.00,  Monthly Amount: $3150.80 Number of Years: 15,
Total Amount Paid for loan: $567144.32
Type: Commercial, Cost: $400000.00,  Loan Amount: $260000.00,  Monthly Amount: $2575.59 Number of Years: 15,
Total Amount Paid for loan: $463605.51
Type: Agricultural, Cost: $150000.00,  Loan Amount: $134000.00,  Monthly Amount: $902.95 Number of Years: 20,
Total Amount Paid for loan: $216708.28
Type: Agricultural, Cost: $150000.00,  Loan Amount: $140000.00,  Monthly Amount: $1023.30 Number of Years: 20,
Total Amount Paid for loan: $245591.88

Continue?
```



```
Type: Residential, Cost: $250000.00,  Loan Amount: $220000.00,  Monthly Amount: $1520.01 Number of Years: 25,
Total Amount Paid for loan: $456001.61
Type: Residential, Cost: $250000.00,  Loan Amount: $195000.00,  Monthly Amount: $1226.76 Number of Years: 25,
Total Amount Paid for loan: $368027.25
Type: Commercial, Cost: $400000.00,  Loan Amount: $300000.00,  Monthly Amount: $3150.80 Number of Years: 15,
Total Amount Paid for loan: $567144.32
Type: Commercial, Cost: $400000.00,  Loan Amount: $260000.00,  Monthly Amount: $2575.59 Number of Years: 15,
Total Amount Paid for loan: $463605.51
Type: Agricultural, Cost: $150000.00,  Loan Amount: $134000.00,  Monthly Amount: $902.95 Number of Years: 20,
Total Amount Paid for loan: $216708.28
Type: Agricultural, Cost: $150000.00,  Loan Amount: $140000.00,  Monthly Amount: $1023.30 Number of Years: 20,
Total Amount Paid for loan: $245591.88
```