Grade 12 Assignment #3 Java Programming

A Simple Car Loan Payment Calculator

Let's combine a few of the concepts that you have learned so far: conditionals, Boolean expressions, and arithmetic expressions and build a program that calculates the monthly payment owed on a car loan.

In this project, you will write a program that will calculate the *monthly* car payment a user should expect to make after taking out a car loan. The program will include the following:

- Car loan amount
- Interest rate of the loan
- Length of the loan (in years)
- Down payment

The instructions provided are general guidelines. Upon completion of the project, feel free to add functionality of your own.

Tasks:

There are 22 Tasks to complete for this assignment:

1. Open the BlueJ IDE editor to create the code needed for the program called A Simple Car Loan Payment Calculator.

2. First set up the BlueJ IDE. Create a project (file) with a public class called CarLoan.

3. Then create a main body for the program code to reside in (public static void main(String[] args)).

   The main part of the code will focus on some if—else if—else conditional (control flow) statements. These statements will decide on the validity of the loan and then determine the repayment schedule needed to pay off the car. The output that will be printed to the screen will be the monthly payment including interest. The user input (car loan parameters) will be predetermined using variables assigned to integers.

4. Within the main body of code, create a variable. An int variable called carLoan and set it equal to 10000.

5. Next, create an int variable called loanLength and set it equal to 3. This will represent a loan length of 3 years.

6. Now create an int variable called interestRate and set it equal to 5. This will represent an interest rate of 5% on the loan.

7. Next, create an int variable called downPayment and set it equal 2000. This will represent the down payment provided by a user for this car purchase.

8. Let's build in some requirements that would prevent a buyer from taking out an invalid car loan. Write an if statement that checks whether the loan length is less than or equal to zero or whether the interest rate is less than or equal to zero.

9. Next, inside of the if statement, print out a helpful error message to the user. For example, you can print out something like: Error! You must take out a valid car loan.

10. What if the down payment is more than the price of the car? Add to the if statement and use else if to check whether the down payment is greater than or equal to the car loan.

11. Inside of the else if block, print out a helpful message to the user about the down payment and car loan amounts. For example, you can print out something like: The car can be paid in full.

12. Finally, if none of the previous Boolean expressions evaluate to true, calculate the monthly payment in an else block.

13. Inside of the else block, create an int variable called remainingBalance and set it equal to carLoan minus downPayment.

14. Since we need the *monthly* payment, we must convert the loan length from years to months. On the next line, create an int variable called months and set it equal to loanLength times 12.

15. Create an int variable called monthlyBalance and set it equal to remainingBalance divided by months. This represents the monthly payment *without* interest included.

16. The user needs to pay interest on the loan borrowed. Create an int variable called interest and set it equal to the monthly balance times the interest rate, divided all by 100.

17. Calculate the final monthly payment. Create an int variable called monthlyPayment and set it equal to the monthly balance plus the interest.

18. On the next line, print out the monthly payment. If you correctly completed this project, the console should print out 233 as the monthly payment.

19. Make sure to include enough printed out statements to the screen (System.out.println()) so that the user knows what is going on and that they are clear regarding the information they are receiving.

20. It would be helpful to describe to other developers what this small Java program does. Write some comments that describes what this program does.

    a. Use multi-line comments to (/* comment in the middle of */):
        i. Write one at the top of the code (before the public class Continents designation) that gives a quick intro/description the assignment.
        ii. Write one at the top of the code (before the public static void main(String[] args)) that summarizes the program.
    b. Use a single line comment to (//then comment):
        i. Create 3 comments anywhere you deem necessary or important in the code. Remember the comment is to highlight or explain what is going on or what is being done in a particular way or used and why.
        ii. Identify each part of the if statements used by indicating its purpose.

iii. Identify the last line of code (anything that ends with a curly bracket }) in every function by writing “End of BLAH-BLAH function”.
iv. Identify the end of the program.

21. Once your program is complete, make sure to test it using the BlueJ IDE (do not submit a program that does not work).

22. Lastly, upload (drag and drop) your assignment to the portal. Look for your name under the Assignment 3 webpage.