I

Assignment: Mortgage Calculator

Objective:

To create a simple mortgage calculator program in C# that calculates the monthly mortgage payments based on the loan amount, interest rate, and loan term.

Requirements:

1. The program should prompt the user to enter the loan amount, annual interest rate (in percentage), loan term (in years), and down payment.

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

$$M = P \cdot (\frac{r(1 + r)_n}{(1 + r)_{n - 1}})$$

Where:

- M = monthly mortgage payment
- P = loan amount
- r = monthly interest rate (annual interest rate divided by 12)
- n = total number of monthly payments (loan term multiplied by 12)

3. Display the monthly mortgage payment to the user.

4. Handle user input errors during data entry/ prompts.

5. System must throw a friendly exception where necessary.

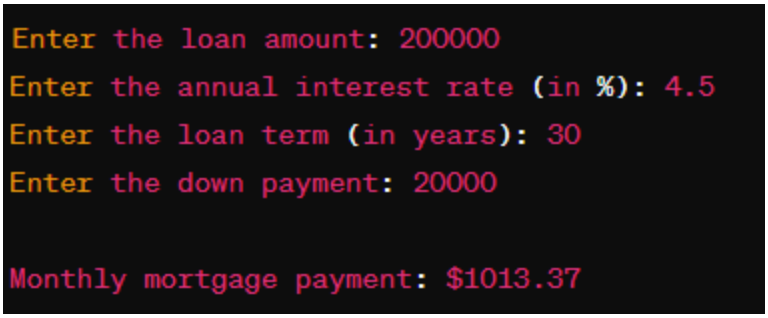
6. Mortgage amount can not be less than 100,000 and can not exceed 10 million.

7. Minimum interest rate would be 0.25% and maximum can be 25%.

8. Amortization will be minimum 15 to maximum 35 years.

9. Display accurate error message to the user and prompt the user to re-enter the value. The calculator must be able to handle errors and should not terminate without calculating the output.

Example Output:



This program calculates the monthly mortgage payment based on the user's input for the loan amount, annual interest rate, and loan term. It handles invalid inputs and displays the monthly mortgage payment to the user.

II

You want to write a small program for an on-line printing company. Your program should ask the user to chose a format (10×15 centimeters, or 8×11 inches), ask if it is the first time the customer order through your company, and a number of copies. Then, calculate the total cost of printing those pictures, knowing that

- Printing a 10×15 centimeters picture costs \$0.20, printing a 8×11 inches picture costs \$0.25,
- A new customer gets a \$3 coupon if the order is more than \$5,
- A 10% discount is given if more than 50 copies were ordered,
- The two previous offers can be cumulated.

Display on the screen a message starting by "Welcome!", then a new line, then "We cherish our new customers" if it is the first time the user uses your company, ", so we're giving you a \$3 discount!" if the user is allowed to get the coupon, then print the total and "You had a 10% discount!" if the user ordered more than 50 copies. See below for examples of execution, where the user input is underlined, and hitting carriage return is represented by ↵.

```
Enter 'c' for 10x15cm, anything else for 8x11in.
c ↵
Is this your first time here? Type 'y' for 'yes'.
y ↵
Enter a number of copies.
90 ↵
Welcome!
We cherish our new customers, so we are giving you a $3 discount!
Your total is $13.50. You had a 10% discount!

Enter 'c' for 10x15cm, anything else for 8x11in.
p ↵
Is this your first time here? Type 'y' for 'yes'.
Not_at_all↵
Enter a number of copies.
120 ↵
Your total is $27.00. You had a 10% discount!
```