CASE STUDY-1

Loan Amortization Schedule

Write a Python program that generates a loan amortization schedule based on user input.

Requirements

The program should:

1. Prompt the user to enter:
    - **Loan amount** (floating-point number)
    - **Annual interest rate** (percentage as an integer)
    - **Loan duration** (integer, in years)
2. Assume equal monthly payments and compute:
    - **Fixed monthly payment** using the formula:

$$M = P \times \frac{r(1+r)^n}{(1+r)^n - 1}$$

        - M = Monthly payment
        - P = Loan amount
        - r = Monthly interest rate (annual rate / 12 / 100)
        - n = Total number of months (years × 12)
3. Display a well-formatted table with:
    - **Month Number**
    - **Starting Balance**
    - **Payment Amount**
    - **Interest Paid**
    - **Principal Paid**
    - **Remaining Balance**
4. Print the total interest paid over the loan term at the end.

Expected Output Format

```
Loan Amortization Schedule
================================================================================
Month    Starting Balance    Payment    Interest Paid    Principal Paid    Remaining Balance
================================================================================
1            50000.00          1060.66      208.33          852.33          49147.67
2            49147.67          1060.66      204.79          855.87          48291.80
...
60           1058.12           1060.66      4.41            1056.25         0.00
================================================================================
Total Interest Paid:  6363.77
```

CASE STUDY-2

Automated Text Complexity Analysis using the Dale-Chall Readability Score

In 1948, Edgar Dale and Jeanne Chall developed a readability formula called the **Dale-Chall Readability Score**. This formula assesses the difficulty of a given text based on the proportion of difficult words (words not on a standard list of familiar words) and the average sentence length.

Dale-Chall Readability Formula

The readability score **D** is calculated using the following formula:

$$D = 0.1579 \times \left(\frac{\text{difficult words}}{\text{total words}} \times 100 \right) + 0.0496 \times \left(\frac{\text{total words}}{\text{total sentences}} \right)$$

If more than **5% of the words** in the text are difficult, **an additional 3.6365** is added to the score.

Grade-Level Interpretation of Dale-Chall Score

Dale-Chall Score	Approximate Grade Level
4.9 or lower	4th Grade and below
5.0 – 5.9	5th – 6th Grade
6.0 – 6.9	7th – 8th Grade
7.0 – 7.9	9th – 10th Grade
8.0 – 8.9	11th – 12th Grade
9.0+	College Level

Task Description

Write a Python program that:

1. Receives a **text file name** from the user.
2. **Reads** the contents of the file.
3. **Counts the number of sentences** in the text.
4. **Counts the total words** in the text.
5. **Counts the number of difficult words**, using a predefined list of common words.
6. **Calculates the Dale-Chall Readability Score** using the given formula.
7. **Determines the corresponding grade level**.
8. **Outputs the results** in a well-formatted way.