Exercise: Payment Receipt Transformation

Objective:

Transform and format customer loan payment data into a structure suitable for an email template. This exercise focuses on variables, data types, string formatting, arithmetic operations, file handling and exception handling

Scenario:

You work as a data engineer at **MyFin Financials**. Your task is to transform customer loan data, extracted from a CRM system, into a format suitable for generating a payment receipt. Generate the payment receipt as a .txt file. Assume the data is already extracted and provided as variables.

You need to process this data and generate the receipt in the following format:

Output Example:

From,
XXX Financials
Vancouver

To,
O'Connor, John
123 Main St - unit 203,
Vancouver,
BC,
Canada V4X 3A2

Dear John,

We have received the payment of $100.00 on 2024-12-30. Thank you for your payment. Attached is the breakdown of your payment.

Interest paid = $66.35
Loan Protection Premium = $12.50
Total mandatory amount = $78.85
Balance (applied to principal) = 21.15
Latest Principal balance = 4978.85

Next minimum payment amount = 78.57

Instructions:

1. **Data Setup: Use the following variables as the input for your program:**

```
cust_id = "125322"
cust_fname = "John"
cust_lname = "O'Connor"
address_line1 = "123 Main St"
address_line2 = "unit 203"
city = "Vancouver"
province = "BC"
country = "Canada"
postal_code = "V4X3A2"
principal = 5000  # Loan principal amount
apr = 34.5        # Annual Percentage Rate
lp = 12.5         # Loan Protection Premium
payment_amount = 100  # Payment amount made by the customer
payment_date = "2025-03-30"  # Date of payment
```

- **Required Calculations:**
  - **Interest paid:** The biweekly interest is calculated as

$$principal * \frac{apr}{26 * 100}$$

  - **Total mandatory amount:** Sum of interest paid and loan protection premium.
  - **Balance applied to principal:** Subtract the total mandatory amount from the payment amount.
  - **Latest principal balance:** Subtract the balance applied to principal from the original principal.
  - **Next minimum payment amount:** interest on latest principal + lp amount

- **Output Formatting:**
  - Use string formatting or f-strings to format the data in the desired format.
  - Ensure monetary values are formatted to two decimal places.
  - Write the formatted output to the file receipt_<cust_id>_<YYYY_MM_DD>. For example, if you run it on Mar 26, 2025 for cust_id 125322, the file should be named as receipt_125322_2025-03-26.
  - Create a folder in your local and store the receipt there. Optionally, you can also organize the receipts by year month etc.

Hints:

- Use arithmetic operations for the calculations.
- Use `round()` to round monetary values to two decimal places.