Android Practical: Cash Machine

1. Objective

Create an Android application that simulates a cash management system using denominations of ₹10, ₹20, ₹50, ₹100, ₹200, and ₹500. The application should allow the user to **credit** or **debit** amounts, maintain a **transaction history**, and show a **summary of available denominations**.

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2. Application Structure

- **Main Activity**
    - Hosts a **Bottom Navigation** with three options:
        1. **Credit/Debit**
        2. **History / Statement**
        3. **Summary**
- **Fragments**
    - **Credit/Debit Fragment**: Handles credit and debit actions.
    - **History Fragment**: Displays transaction history.
    - **Summary Fragment**: Displays denomination counts and total balance.

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3. Functional Flow

3.1 Credit/Debit

- User selects **Credit** or **Debit** mode.
- User enters the **amount** in an input field.
- On submit:
    - The amount is validated (positive number, multiple of ₹10).
    - The amount is **distributed among available denominations**.
    - Denomination counts are updated.

    - A record is added to **History**.
    - The **Summary** is updated.

3.2 History

- Shows a list of all transactions in reverse chronological order.
- Each transaction entry includes:
    - Type (Credit or Debit)
    - Amount
    - Timestamp
    - Denomination breakdown (e.g., ₹500 × 1, ₹200 × 1, ₹50 × 1, ₹10 × 1)

3.3 Summary

- Displays **current count** of each denomination.
- Shows the **total balance** (sum of denomination values).
- Provides a clear view of available cash in the system.

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4. Validations

- Amount must be a **positive number**.
- Amount must be a **multiple of ₹10**.
- For **Debit**:
    - Balance must be **greater than or equal** to the requested amount.
    - Denominations must be available to dispense the **exact amount**.
- Clear error messages should be displayed for invalid input or insufficient denominations.

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5. Transaction Management

- Every Credit or Debit action creates a **transaction record**.
- Each record stores:

    - Transaction type (Credit/Debit)
    - Amount
    - Date and time
    - Denomination distribution

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6. User Interface Layout

Credit/Debit Screen

- Toggle for **Credit / Debit**
- Input field for amount
- Submit button
- Preview section showing how the amount will be distributed into denominations
- Error message area

History Screen

- Scrollable list of transactions
- Each transaction shows: Type, Amount, Date/Time, Denominations

Summary Screen

- Grid or list of denominations with:
    - Denomination value
    - Available count
    - Subtotal for that denomination
- Total balance displayed at the bottom

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7. Acceptance Criteria

- Users can credit any valid amount and see denominations updated.
- Users can debit amounts only if the exact denominations are available.
- All transactions appear in History with denomination details.
- Summary always reflects the latest state of denominations and total balance.
- Invalid inputs show clear validation messages.

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8. Deliverables

- Android application with the described functionality.
- Working Credit/Debit, History, and Summary flows.
- Proper input validations and denomination management.
- Documented test cases covering:
    - Successful credit and debit
    - Invalid inputs
    - Insufficient balance
    - Inability to dispense exact amount

Sample UI for understanding: