

### Exercise 1:

#### Inventory Management System using Python Inheritance

##### Scenario: Designing an Inventory Management System

You are tasked with designing an **Inventory Management System** that handles various types of products. Each product shares common attributes but has specific attributes based on the category of the product. The system must support operations such as adding products, calculating inventory value, applying discounts, and checking stock levels.

##### Problem Definition:

We need to manage three types of products:

1. **Electronics** (e.g., phones, laptops).
2. **Clothing** (e.g., shirts, pants).
3. **Groceries** (e.g., fruits, vegetables).

All product types share basic attributes like **name**, **price**, **quantity**, and **SKU** (Stock Keeping Unit). However, they also have specific attributes:

- **Electronics** may have **warranty period** and **brand**.
- **Clothing** has attributes like **size** and **material**.
- **Groceries** include **expiration date** and **organic status**.

Additionally, the system needs to:

1. Add new products.
2. Update stock.
3. Calculate the total value of inventory.
4. Apply discounts based on product type.
5. Check if products are low in stock.

### Exercise 2

#### Building a Payment Processing System

You are tasked with designing a **Payment Processing System** that handles multiple payment methods (Credit Card, PayPal, Bank Transfer). Each payment method has unique steps involved in processing payments, but they all share the common interface of **processing a payment** and **issuing a refund**.

##### Problem Definition:

The system must support the following payment methods:

1. **Credit Card Payment:** Requires card number, expiry date, and CVV to process payments.
2. **PayPal Payment:** Uses a PayPal account email and password.
3. **Bank Transfer Payment:** Processes payments using a bank account number and a sort code.

Each payment method has:

- A method to **process payments**.
- A method to **issue refunds**.
- Error handling for failed payments.