Industry Problem Statement

Retail Billing & Invoice Generation System (Python)

Business Background

A retail chain wants to build a Python-based billing system to manage:

- Product sales
- GST calculation
- Discount logic
- Invoice generation

The system should simulate a **real Point-of-Sale (POS)** workflow.

Task 1: Capture Customer & Product Details

Objective

Collect billing inputs.

Requirements

Accept:

- Customer Name
- Product Name
- Price per unit
- Quantity

Business Rules

- Price > 0
- Quantity ≥ 1

Task 2: Item Total Calculation

Objective

Calculate cost per product.

Formula

```
Item Total = Price × Quantity
```

Task 3: Subtotal Calculation

Objective

Compute bill subtotal.

Requirements

- Support multiple products

Task 4: GST Calculation

Objective

Apply government tax.

Rules

- Essentials → 5% GST
- Electronics → 18% GST

Task 5: Discount Eligibility Check

Objective

Encourage higher purchases.

Rules

Subtotal	Discount
≥ ₹10,000	10%
≥ ₹5,000	5%
< ₹5,000	No Discount

Task 6: Discount Amount Calculation

Objective

Calculate savings for customer.

Task 7: Final Bill Amount

Formula

```
Final Amount = Subtotal + GST − Discount
```

Task 8: Invoice Summary (Procedural)

Summary Should Include

- Product details
- Subtotal
- GST

- Discount
- Final Amount

Task 9: Store Daily Sales Data

Objective

Maintain sales history.

Task 10: Product Class Design

Attributes

- product_id
- name
- price

Task 11: Bill Class Design

Attributes

- customer_name
- products
- subtotal

Task 12: Tax Calculation Method

Method

- calculate_gst()

Task 13: Discount Method

Method

- apply_discount()

Task 14: Invoice Generation Method

Method

- generate_invoice()

Task 15: Printable Invoice Output

Output Format (Example)

```
Customer Name : Anjali
Subtotal      : ₹8,500
GST           : ₹1,530
Discount      : ₹425
Final Amount  : ₹9,605
```