Software Requirement Specification for Calculator

Revenue/Profit Calculator Requirements

1. The system shall simulate sales for each product using a random generator.
2. The system shall ensure sales never exceed stock or go below zero.
3. The system shall calculate total revenue based on selling price.
4. The system shall calculate cost and profit.
5. The system shall return a summary + itemized list.

Monthly Inventory Spend Calculator Requirements

6. The system shall filter orders by year and month.
7. The system shall aggregate total spend.
8. The system shall group spend by category.
9. The system shall identify the highest-cost category.
10. The system shall return values in JSON format.

These become the foundation for black-box testing later.

Functional Requirements for Calculation Features

1. Revenue & Profit Calculator

1.1 Input Requirements

1.1.1 The system shall accept a list of products, where each product contains:

- Name
- Current stock quantity
- Cost price
- Selling price

1.1.2 The system shall accept an integer representing the number of days to simulate sales.

1.2 Sales Simulation Requirements

1.2.1 The system shall generate simulated sales using a pseudo-random number generator.
1.2.2 The simulated sales shall never exceed the available stock.
1.2.3 The simulated sales shall never produce negative values.
1.2.4 The system shall reduce product stock by the number of units sold.

1.3 Calculation Requirements

1.3.1 The system shall calculate total revenue using the formula:

revenue = sold_quantity × selling_price

1.3.2 The system shall calculate total cost using the formula:

cost = sold_quantity × cost_price

1.3.3 The system shall calculate profit using the formula:

profit = revenue − cost

1.3.4 The system shall calculate and return:

- Total revenue for all products
- Total cost for all products
- Total profit for all products

1.3.5 The system shall return a detailed breakdown per product.

1.4 Output Requirements

1.4.1 The system shall return results in JSON format.
1.4.2 The JSON shall include a summary and details section.
1.4.3 The system shall preserve deterministic behavior when a seed is provided (optional testing mode).

2. Monthly Inventory Spend Calculator

2.1 Input Requirements

2.1.1 The system shall accept a list of purchase orders.
2.1.2 Each order shall contain:

- Date
- Quantity
- Cost price
- Category
- Product name

2.1.3 The system shall accept an input year and month.

2.2 Filtering Requirements

2.2.1 The system shall filter orders matching the given year and month.
2.2.2 The system shall ignore all orders outside the specified month.

2.3 Calculation Requirements

2.3.1 The system shall calculate total monthly inventory spend:

spend = quantity × cost_price

2.3.2 The system shall group spend amounts by category.
2.3.3 The system shall determine the category with the highest total spend.
2.3.4 The system shall return the following:

- Total spend
- Breakdown of spend per category
- Highest cost driver

2.4 Output Requirements

2.4.1 The system shall return all values in JSON format.
2.4.2 If no orders exist for the selected month, the system shall return an empty result with zero totals.