

**IT - 314: SOFTWARE ENGINEERING**

**Lab Session:**

**Modeling Class Diagram and Activity  
Diagram**

**(Point of Sale System)**

**Name: SMIT FEFAR**

**ID: 202201253**

**Question-1: Develop Use Case Textual Description for "Process Sale" and "Handle Return" use cases.**

**Use Case: Process Sale**

**Use Case ID:** UC-01

**Use Case Name:** Process Sale

**Actor:** Cashier

**Trigger:** Cashier Begins Purchase Transaction

**Preconditions:**

- The cashier is signed into the POS system.
- The customer is prepared to proceed with the purchase.

**Postconditions:**

- The sale transaction is finalized.
- The stock levels are adjusted accordingly.
- A receipt is printed and handed to the customer.

**Main Flow:**

1. The cashier initiates a new sale transaction.

2. The cashier scans the barcode of the first product.
3. The POS system fetches the product name and price from the catalog database.
4. The system reduces the inventory count to account for the scanned item.
5. The cashier continues scanning items until the customer indicates they have no more to add.
6. A breakdown of all the items and the total amount due is shown by the system.
7. The customer selects a payment option (cash, credit card, or check).
8. The cashier processes the payment via the chosen method.
9. The system verifies that the payment has been completed successfully.
10. The system prints a receipt.
11. The cashier hands the receipt to the customer, marking the end of the transaction.

### **Alternative Flows:**

- **A1: Barcode Not Found**

If the item's barcode is missing from the catalog, the system notifies the cashier and suggests manual input or validation.

- **A2: Payment Failure**

If the payment is declined (for a credit card or check), the system alerts the cashier and requests a different payment method.

## **Use Case: Handle Return**

**Use Case ID:** UC-002

**Use Case Name:** Handle Return

**Actor:** Cashier

**Trigger:** Cashier Initiates Return Process

### **Preconditions:**

- The cashier is logged into the POS system.
- The customer presents the items they wish to return along with the receipt.

### **Postconditions:**

- The return transaction is finalized.
- The stock levels are updated to include the returned goods.
- A return receipt is printed and handed to the customer.

## **Main Flow:**

1. The cashier initiates a new return transaction.
2. The cashier asks the customer for their receipt.
3. The cashier scans the barcode of the returned product(s) from the receipt.
4. The system cross-checks the returned items with the original sale.
5. The system calculates the refund amount.
6. The cashier processes the return and initiates the refund via cash, credit reversal, or another method.
7. The inventory is adjusted to reflect the returned products.
8. A return receipt is generated by the system.
9. The cashier gives the receipt to the customer, marking the end of the return process.

## **Alternative Flows:**

- **B1: Ineligible Return**

If the returned item is ineligible for a refund (e.g., return policy violation, damaged item), the system informs the cashier, and the return is refused.

- **B2: Refund Error**

If there is a problem with processing the refund, the

system alerts the cashier, and the issue may be escalated to the administrator for further action.

## **Question-2: Identify Entity/Boundary Control Objects.**

### **Entity Objects:**

- Products
- Cashier
- Coupon
- Receipt

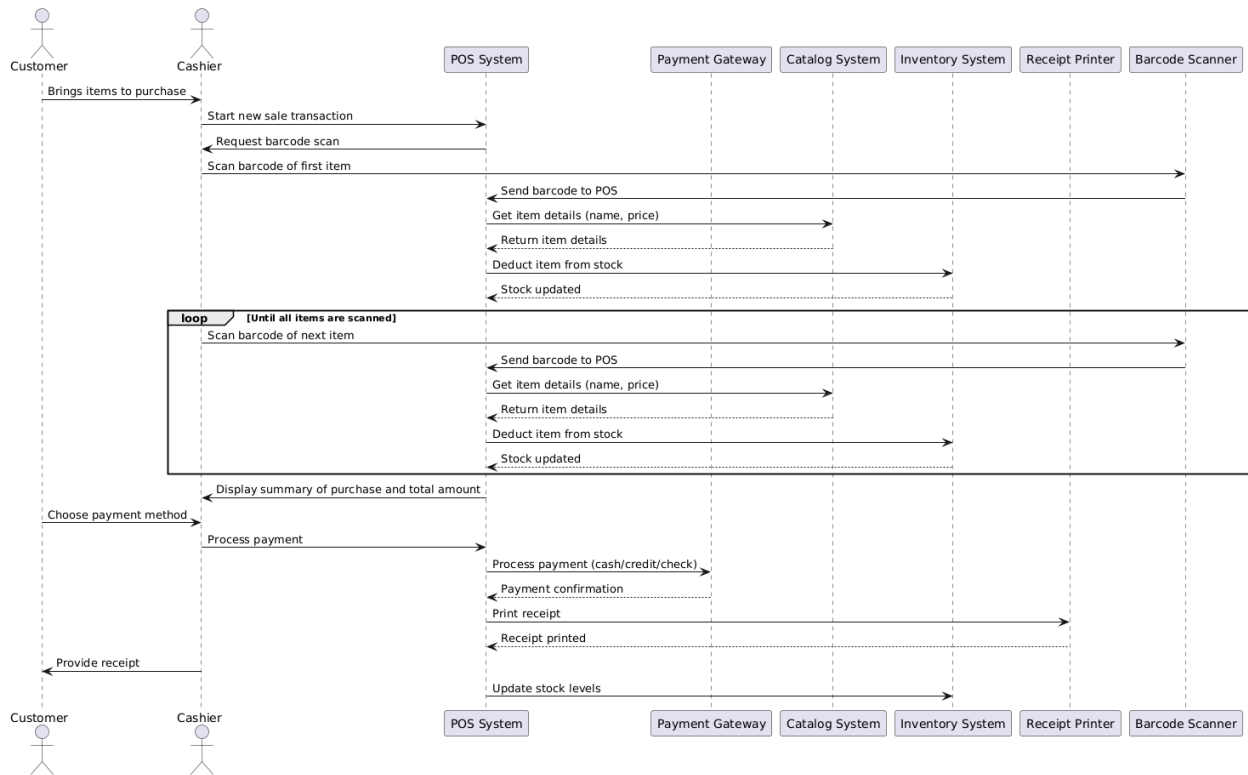
### **Boundary Objects:**

- POS Interface/Terminal
- Barcode interface
- Printer Interface

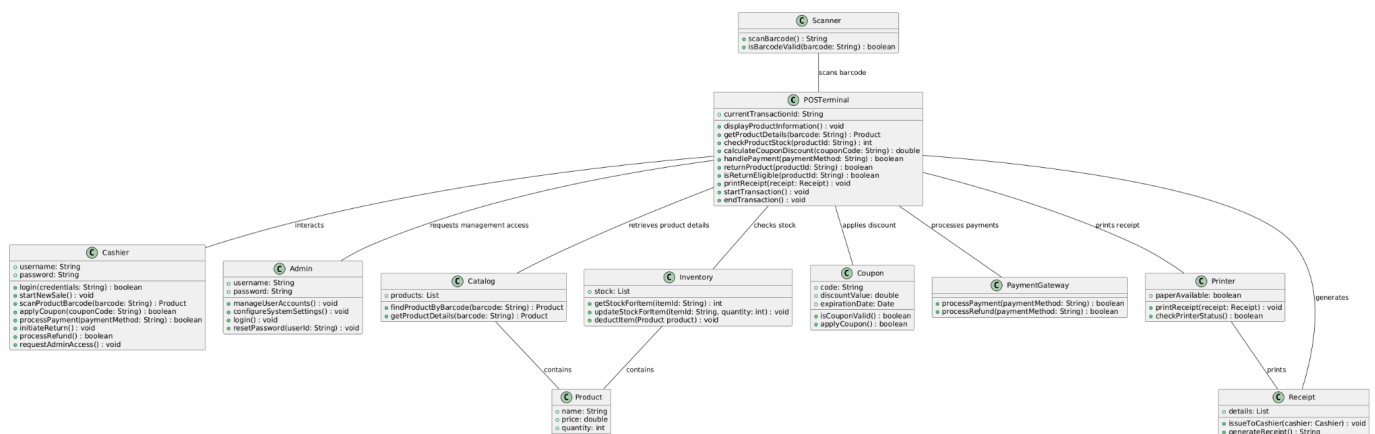
### **Control Objects:**

- SaleController
- InventoryController
- Payment Gateway

## Question-3: Develop Sequence Diagrams.

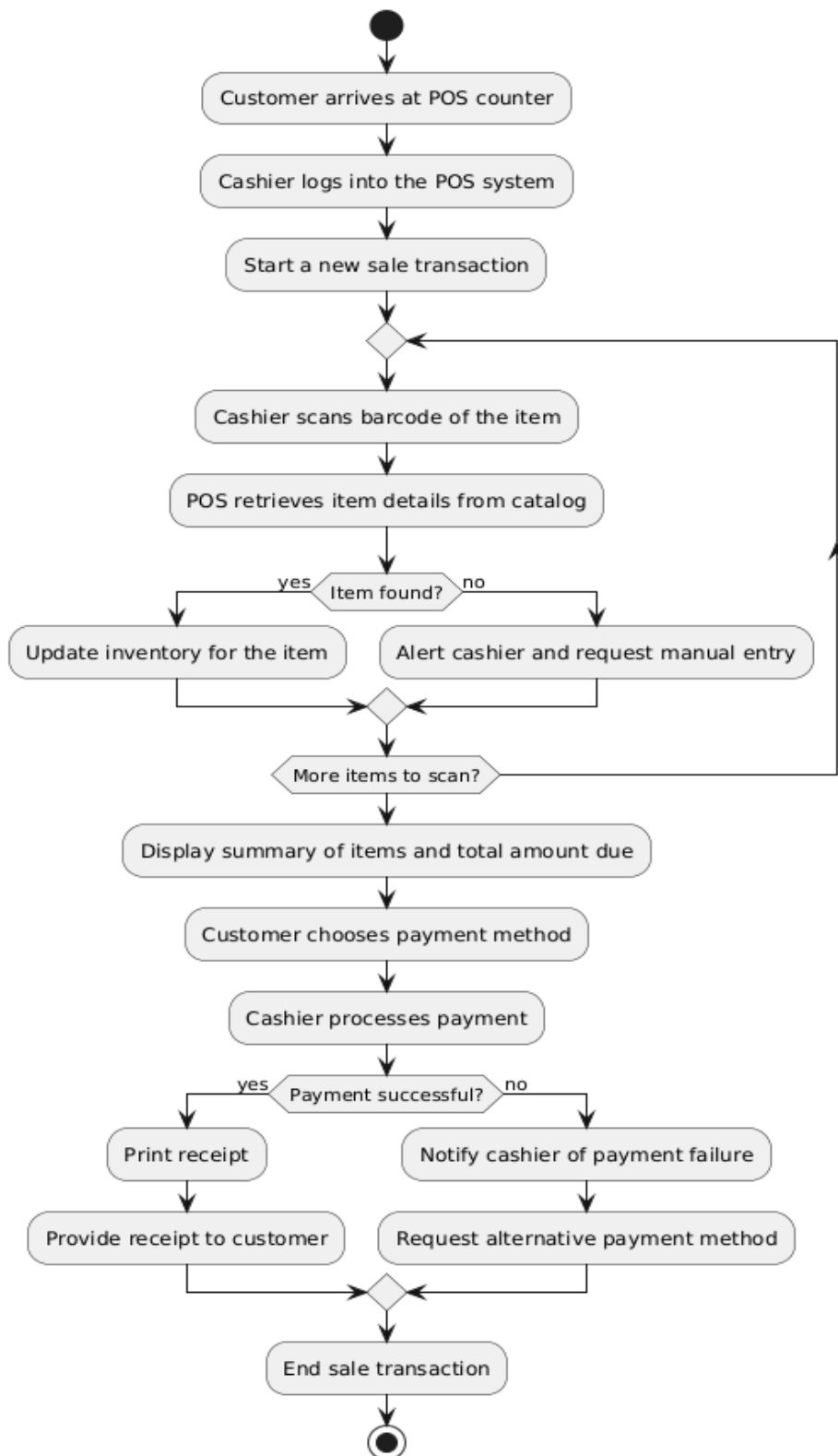


## Question-4: Develop Analysis Domain Models



## Question-5: Develop activity diagram for "Process Sale" and "Handle Return" use cases.

## Activity diagram for “Process Sale”:





## Activity diagram for “Handle return”:

