IT314 Lab: Modeling Class Diagram and Activity Diagram (Point of Sale System)

Made by: Devarshi Patel (202201447)

1) Use case descriptions

➢ **Use case: Process Sale**

- **Actors**: Cashier
- **Trigger**: A customer brings items to the checkout for purchase.
- **Preconditions**: The cashier must be logged in. The product catalog and inventory system must be accessible.
- **Postconditions**: The sale is recorded, inventory is updated, and a receipt is printed.
- **Main Flow**:
  - The cashier initiates a new sale transaction.
  - The cashier scans the barcode of each item.
  - The system retrieves item details (name, price) from the catalog system.
  - The system deducts the item from the inventory.
  - The cashier selects the payment method (cash, credit card, or check).
  - The system processes the payment.
  - The system prints the receipt.
- **Alternate Flow**:
  - If a gift coupon is used:
  - The cashier scans the gift coupon.
  - The system applies the discount from the gift coupon to the sale.
  - If the payment fails:
  - The system notifies the cashier of the failed payment.
  - The cashier selects an alternate payment method.

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➢ **Use case: Handle return**

- **Actors**: Cashier
- **Trigger**: A customer brings items for return.
- **Preconditions**:
  - The cashier is logged into the POS system.
  - The original purchase details are available in the system.
- **Postconditions:**
  - The returned item is recorded, and inventory levels are updated.
  - The refund is processed.
- **Main Flow**:
  - The cashier initiates a return transaction.
  - The cashier scans the barcode of the returned item.
  - The system verifies the item with the original purchase record.
  - The system updates the inventory to add back the returned item.
  - The system processes the refund to the customer.
- **Alternate Flow**:
  - If the return is invalid (e.g., no purchase record found):
  - The system notifies the cashier that the return is invalid.
  - The cashier informs the customer and terminates the return process.
  - If the item is damaged or outside the return period:
  - The system prompts the cashier about the condition.
  - The cashier decides whether to proceed with the return based on store policy.

2)

- **Entity Objects:**
  - Product
  - Sale
  - Return
  - Payment
  - Receipt
  - Coupon
  - Inventory

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- **Boundary Objects:**
  - POS Interface
  - Barcode Scanner
  - Payment Terminal
  - Receipt Printer
- **Control Objects:**
  - Process Sale Controller
  - Handle Return Controller
  - Payment gateway / payment controller
  - Inventory updater / inventory controller

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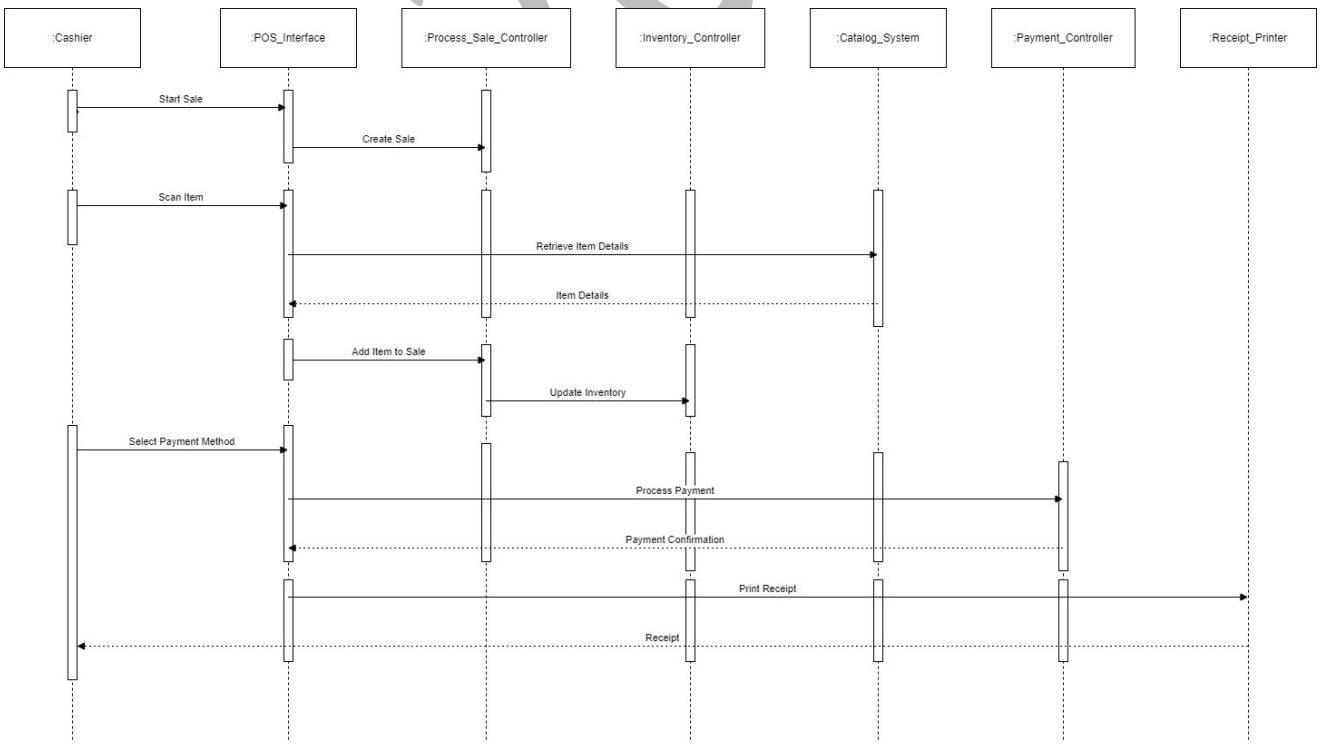
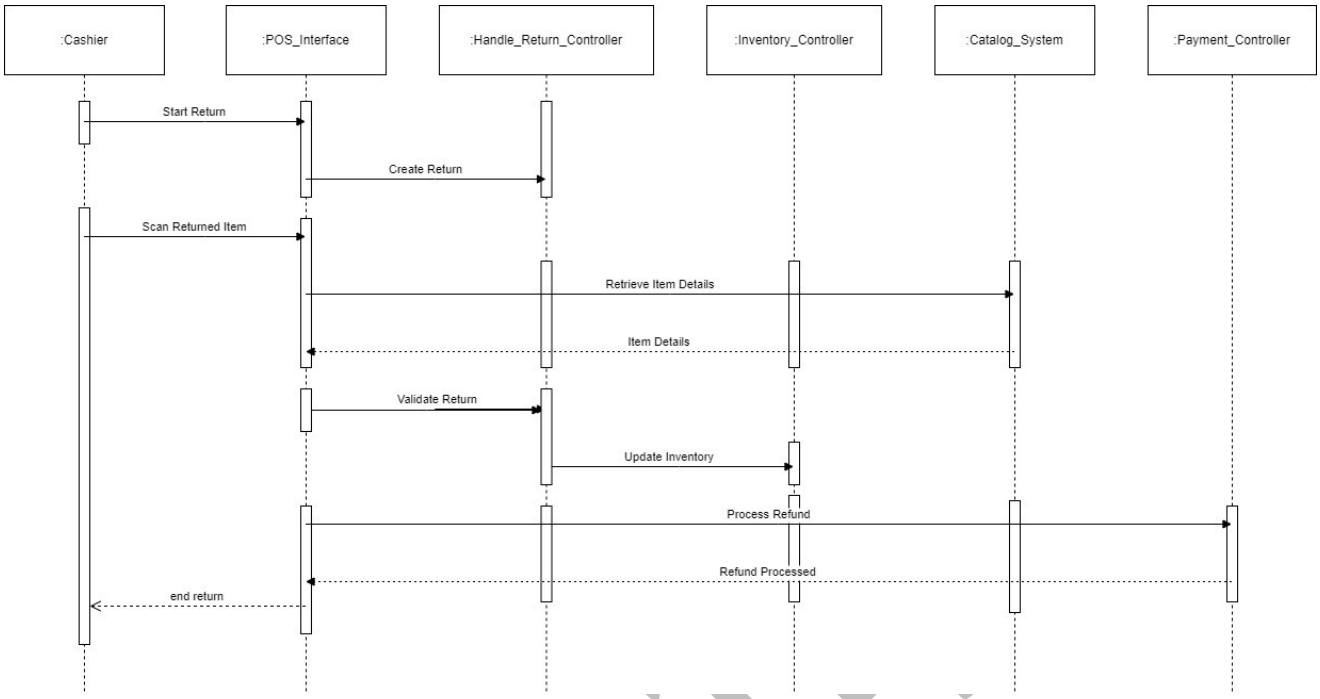
3) Sequence diagrams

➢ **Process sale**



➢ Handle return



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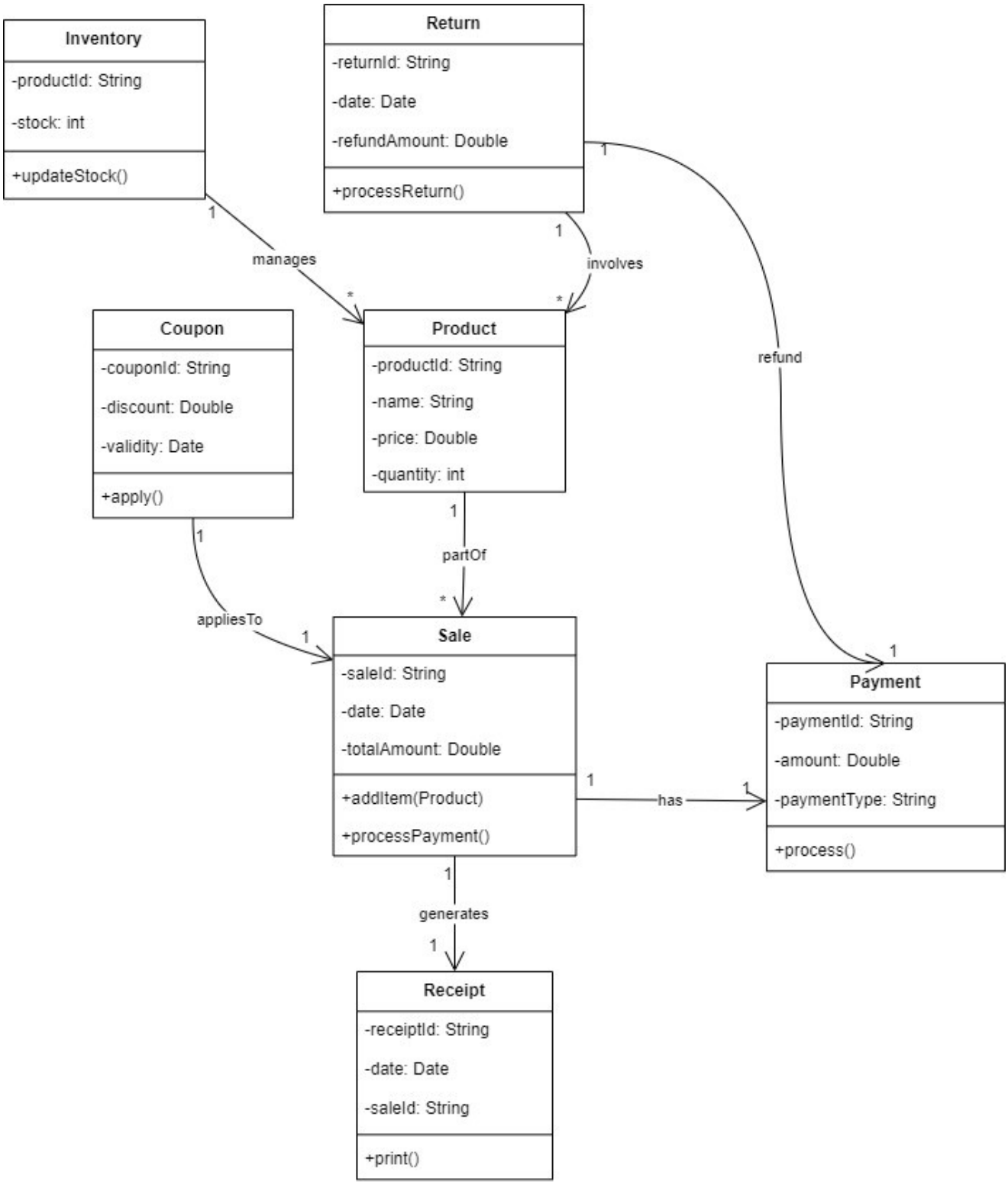
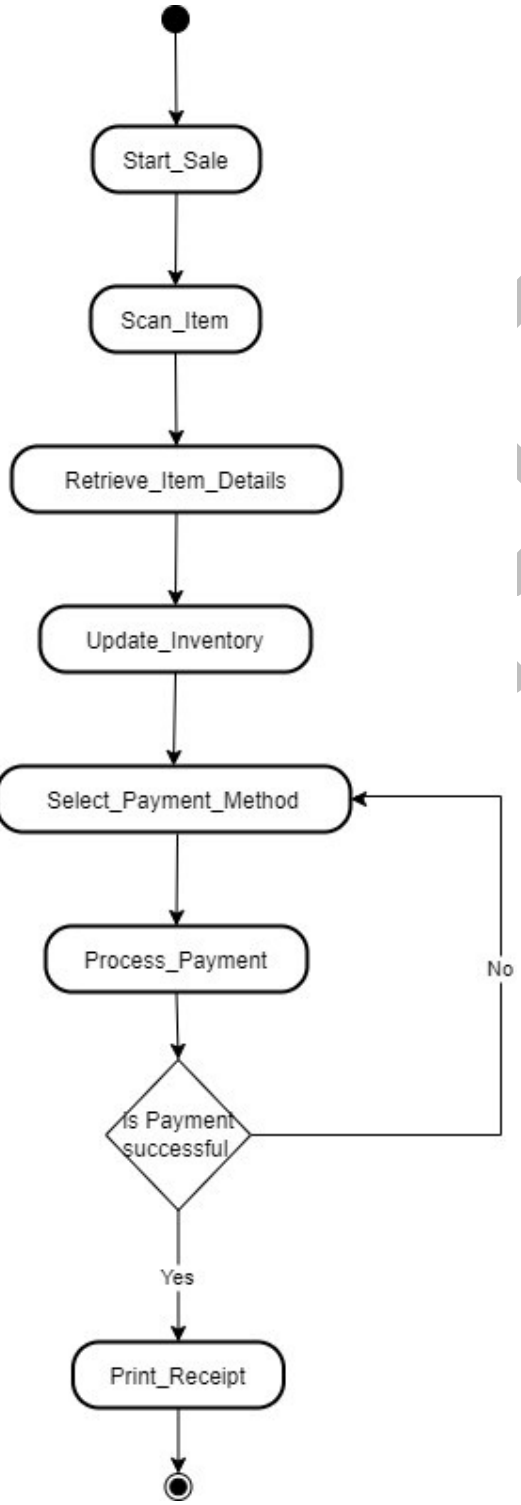
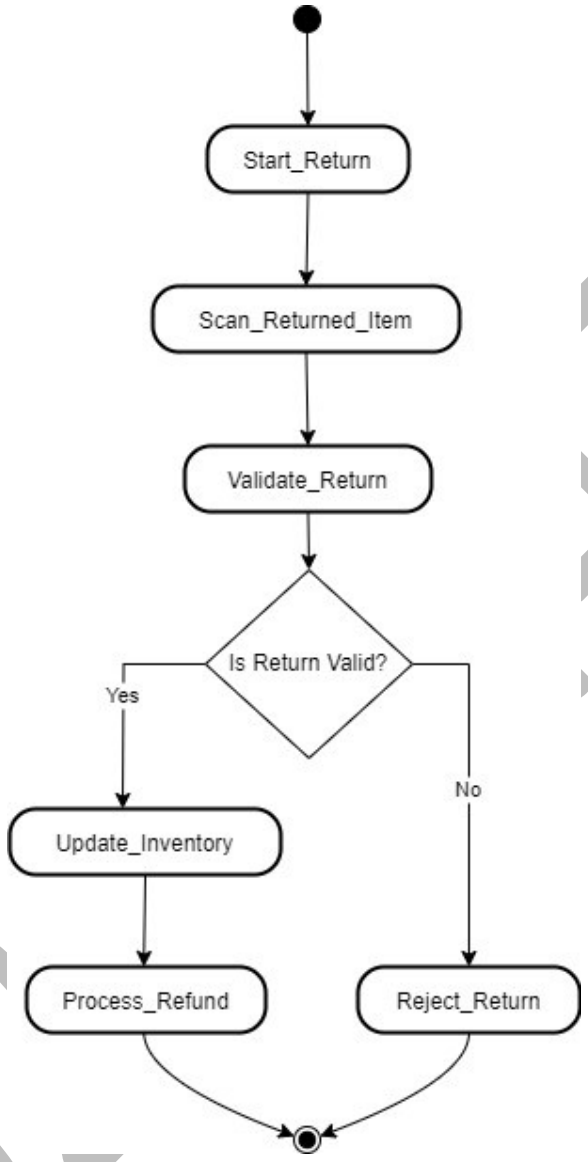
4) Class diagram



5) Activity diagram

- **Process sale**



- **Handle return**