IT - 314 LAB - 06
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Modeling Class Diagram and Activity Diagram
(Point of Sale System)

Use case (Process Sales)
Actors: Customer, Cashier, Catalog system
Pre conditions:

- Cashier is already logged in the system
- Goods/Products are available in the inventory

Post Conditions:

- The transactions are recorded in the system
- Inventory is updated
- Receipt is printed

Flow:

1. A customer arrives at the checkout with goods for purchase.
2. The cashier begins a new transaction and scans the barcode on each product.
3. The POS system requests product details (such as name and price) from the Catalog System. The Catalog System then sends the information back to the POS system.
4. The POS system updates the inventory to reflect the sale of each item.
5. Steps 2-4 are repeated until all item information is collected.
6. The POS system calculates the total amount due.
7. The cashier informs the customer of the total cost.
8. The customer chooses their payment method (cash or credit card).
9. The POS system processes the payment:
    - For cash, it verifies the amount received.
    - For credit card transactions, it checks for authorization.
10. After successful payment, a receipt is printed by the system.

11. The customer receives their receipt and purchased items before leaving the store.

Alternate Flows:

3a. Item Not Found in the Catalog System

1. If an item is not found, the system notifies the cashier, and the transaction cannot continue until the issue is resolved.

3-6a. Customer Requests Item Removal

1. The cashier removes the specified item from the transaction.
2. The system updates the total amount due accordingly.

3-6b. Customer Cancels the Sale

1. The cashier cancels the entire transaction in the system.

8a. Payment Declined

1. If a payment is declined, the system alerts the cashier.
2. The cashier then asks the customer to choose a different payment method.
3. The customer proceeds with an alternative payment option.

8b. Insufficient Cash Provided

1. If the customer pays in cash but does not provide enough, they may choose another payment method.
2. Alternatively, the customer may request to cancel the sale, and the cashier will cancel it in the system.

Use case (Handle returns)

Actors: Customer, Cashier, Catalog System

Pre conditions:

- Customer has a receipt for the item to be returned.
- Cashier is already authenticated and logged in the system.

Post conditions:

- Return transactions are recorded in the system.
- Inventory levels are updated.

Flow:

1. The customer presents an item along with the receipt for return.
2. The cashier scans the receipt to confirm the purchase.
3. The POS system requests item details from the transaction record in the Catalog System.
4. The Catalog System sends the item details back to the POS system.
5. The cashier verifies the return policy eligibility (which includes time frame and item condition).
6. If the item meets eligibility requirements, the system processes the return and updates the inventory to reflect the returned item.
7. The cashier issues the refund according to the customer's chosen payment method.
8. A return receipt is printed by the system.
9. The customer then receives both the return receipt and the refund.

Alternate flow:

2a. Scanned Receipt Cannot Be Verified

1. The system alerts the cashier that the receipt is not found.
2. The cashier asks the customer to provide the receipt again or to share additional purchase details.

3. If the issue is resolved, the return process continues; if not, the return is aborted.

5a. Item Not Eligible for Return

1. The system informs the cashier that the item does not meet the return criteria.
2. The cashier communicates this information to the customer.
3. The return process is halted, and the customer may choose to keep the item.

7a. Refund Processing Error

1. The system notifies the cashier of an error during the refund process.
2. The cashier checks the system for any issues. If resolved, the refund is processed; if not, the customer is informed of the delay or offered an alternative payment method.

Entity/Boundary/Control Objects:

Entity Objects:

1. Transaction
2. Payment System
3. Receipt
4. Coupon
5. Cashier
6. Catalog System
7. Inventory System
8. Item

Boundary Objects:

1. POS Interface
2. Display scanned item details and prices
3. Show total amount due

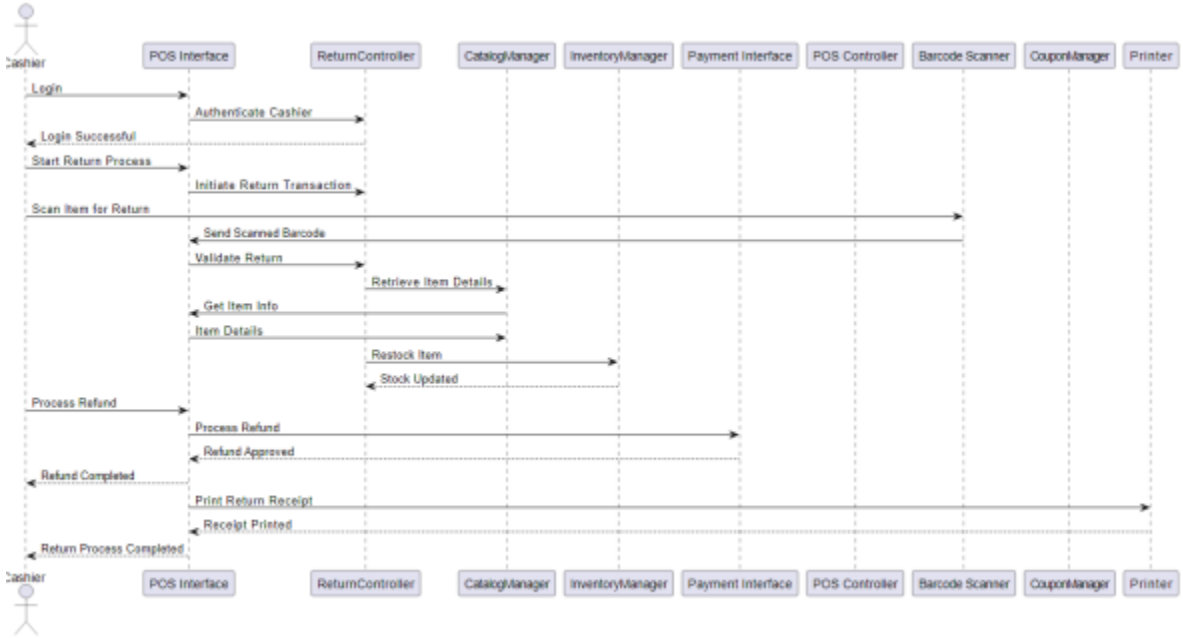
4. Input coupon codes
5. Print receipt
6. Payment Interface
7. Accept cash and credit card payment details
8. Confirm payment processing status
9. Return Interface
10. Accept return requests from customers
11. Display return eligibility and policies
12. Show refund amounts
13. Barcode Scanner
14. Device used to scan product barcodes, interacting with the POS system to retrieve product information.

Control Objects:

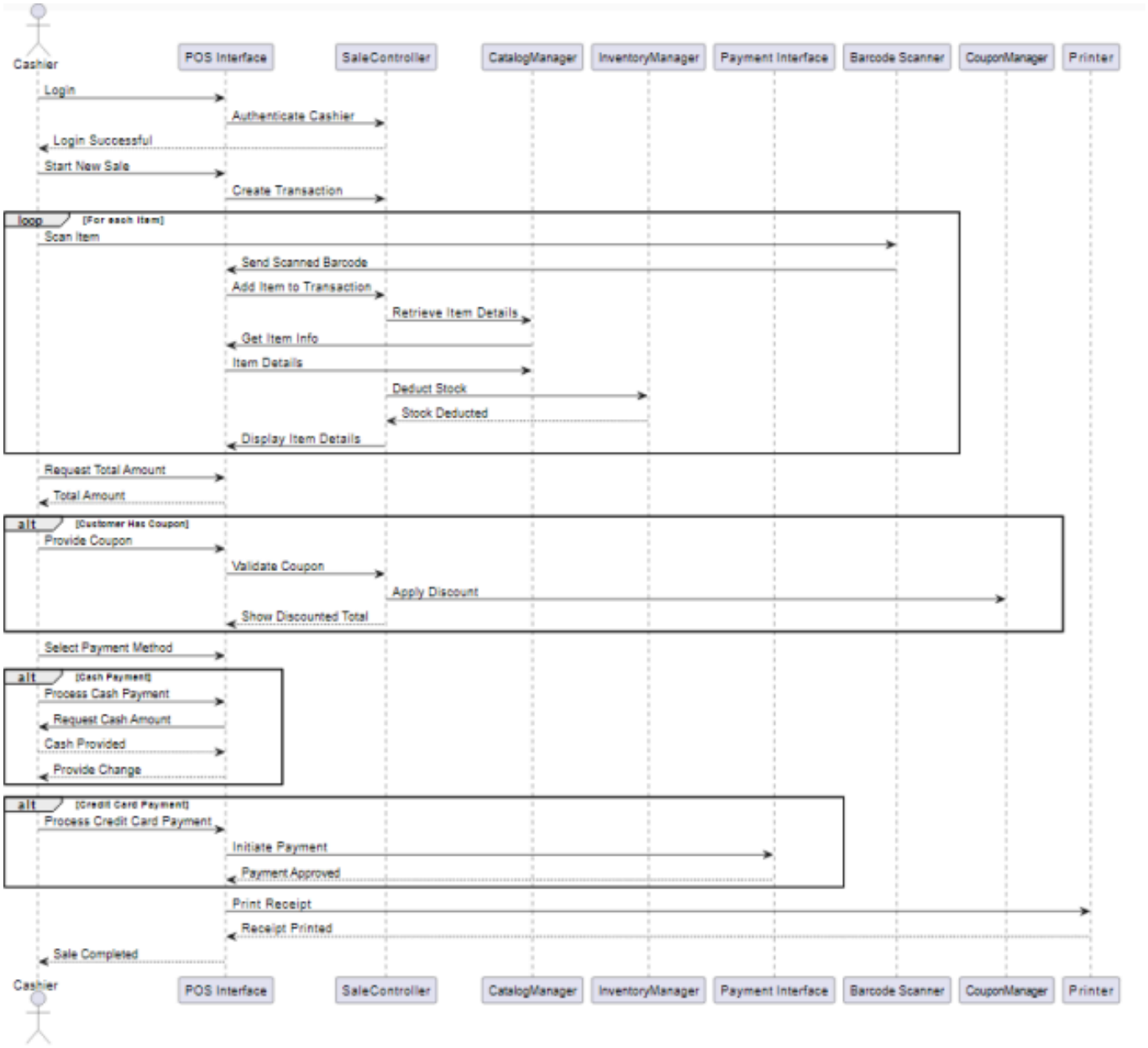
1. SaleController
    a. Manages the sale process flow
    b. Validates items and calculates total amount (including discounts)
    c. Process payments and update inventory
    d. Validate and apply coupon codes
    e. Calculate discounts based on applicable coupons
2. InventoryManager
    a. Update stock levels for sold items
    b. Check item availability
3. CatalogManager ○
    a. Retrieve item details from the Catalog System
    b. Validate item information against inventory
4. ReturnController
    a. Manage the return process flow
    b. Verify receipt and item eligibility
    c. Process refunds and adjust inventory

Sequence Diagrams

Handle returns:

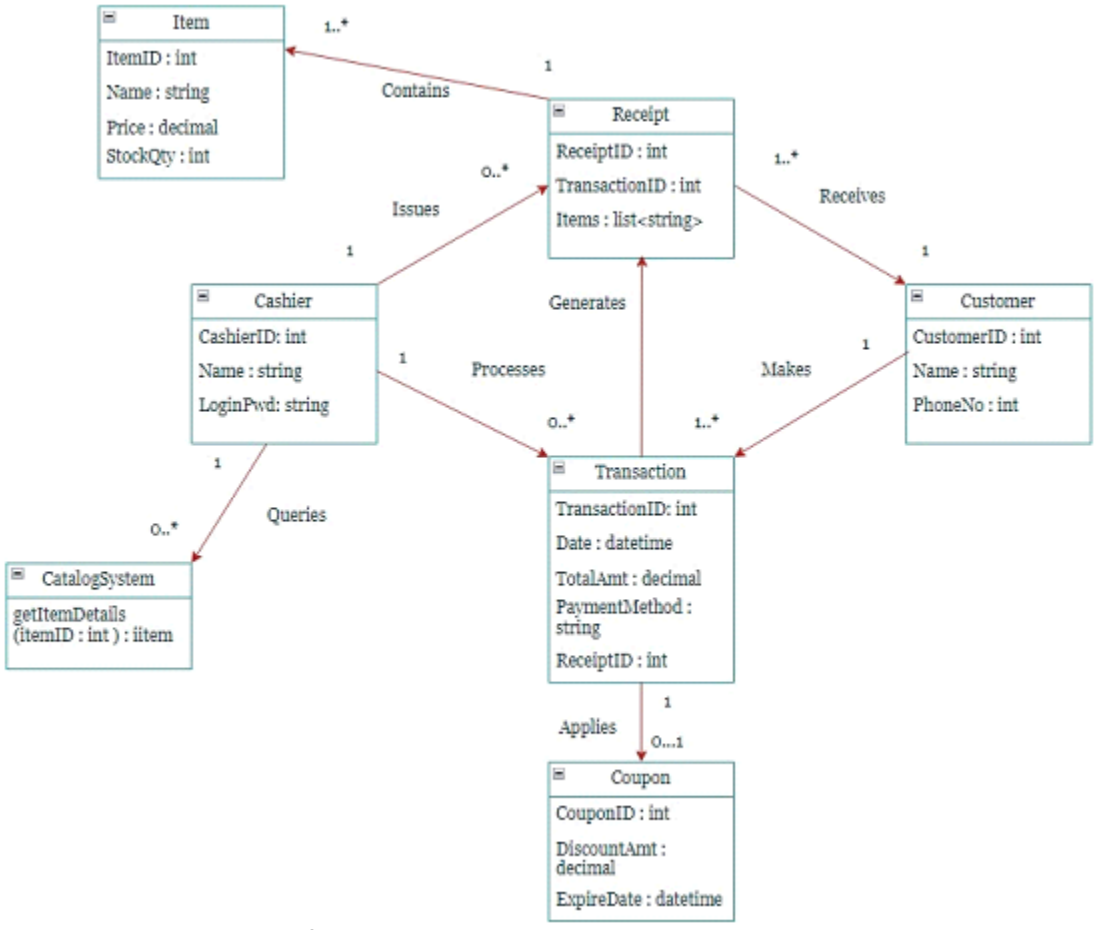


Process sales:

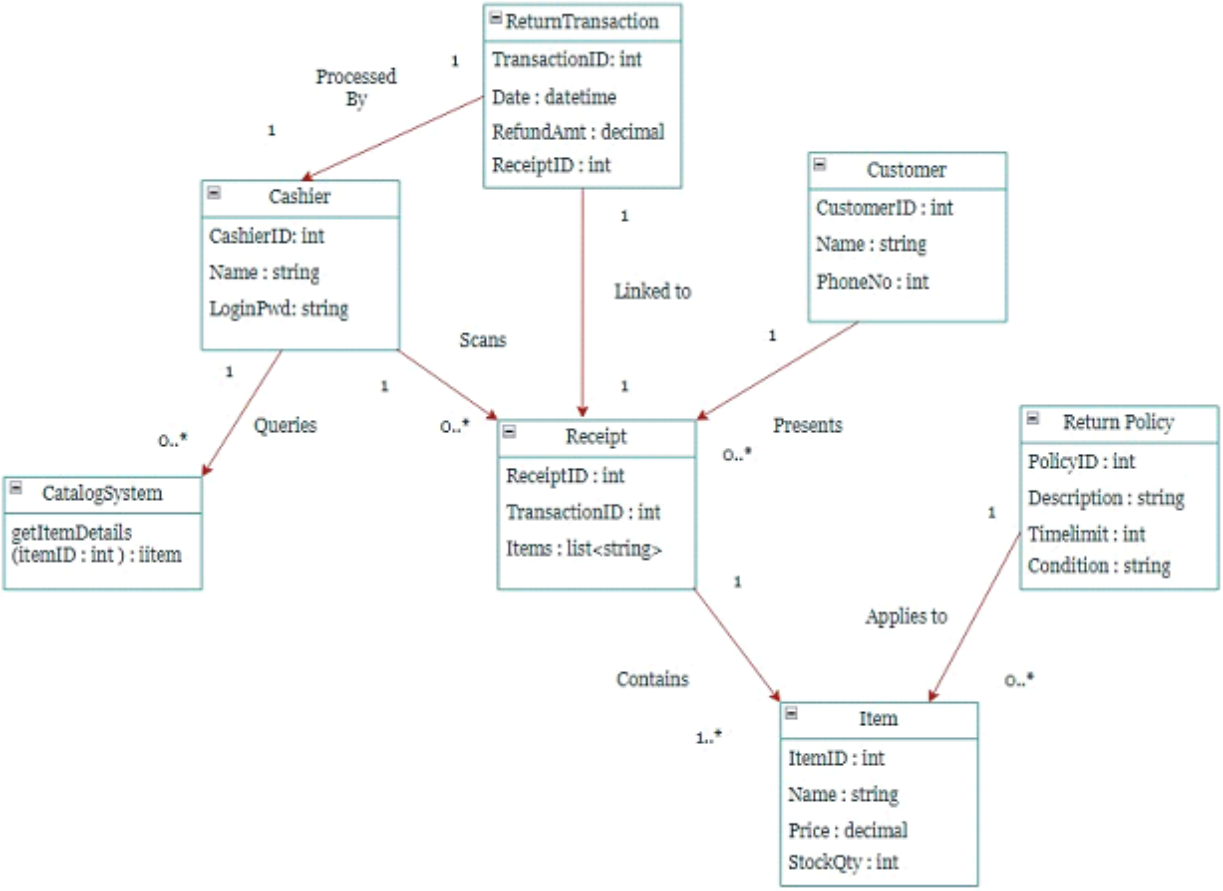


Analysis Domain models

Process sales:

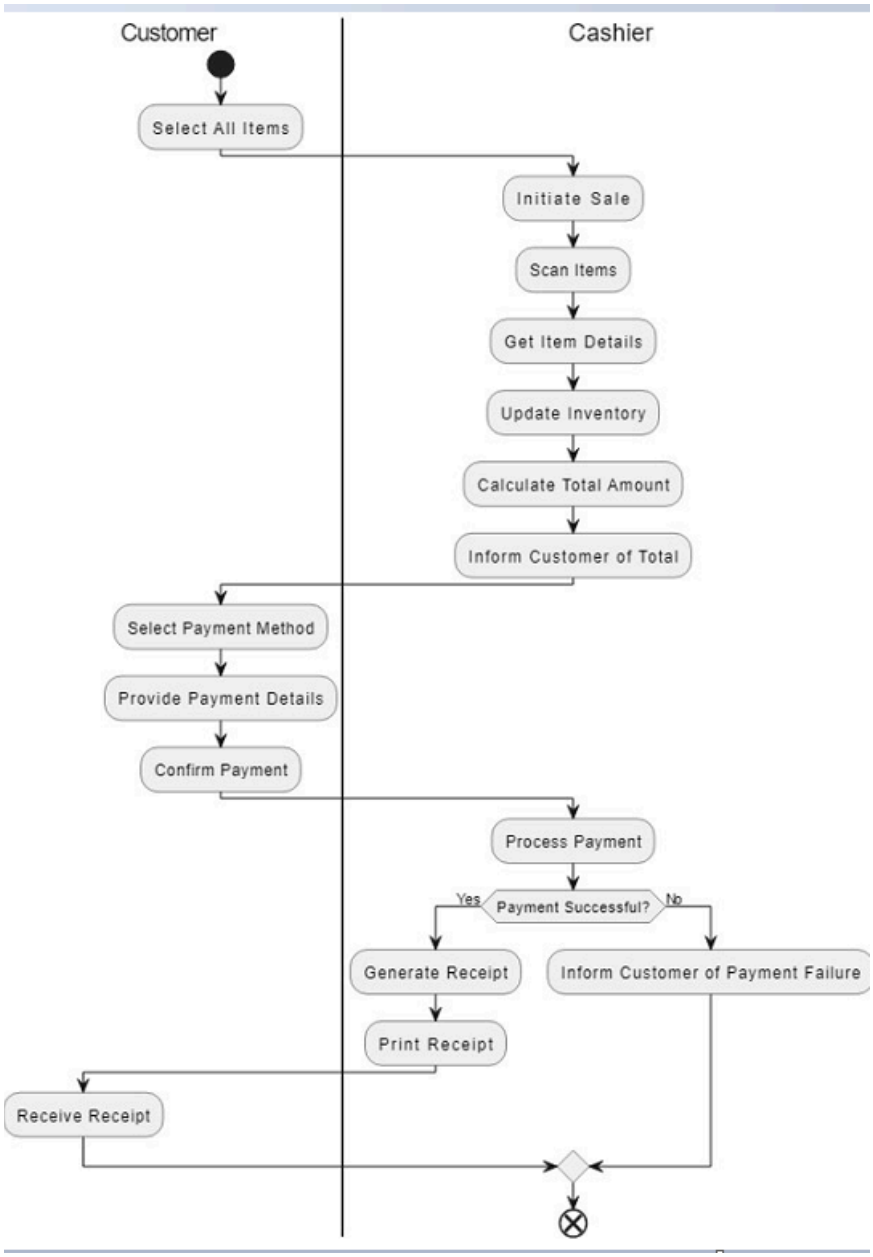


Handle returns:



Activity diagram

Process sales:



Handle returns: