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Subject: Software Engineering

Subject code: IT314

Lab 6

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Topic: Modelling Class Diagram and Activity Diagram (POS System)

Process Sale:

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

Use Case: Process Sale

Actors: Cashier

Preconditions:

- The cashier is logged into the in-store Point of Sale (POS) system.
- The system has the latest inventory and pricing information.
- Payment systems (like card readers) are connected or offline-ready for cash transactions.

Basic Flow:

1. Customers arrive at the checkout point with products.
2. The cashier scans or manually enters the items being purchased.

3. The POS system retrieves the price, description, and stock status from the stored database.
4. The cashier confirms the total price, including any applicable taxes or discounts.
5. The system calculates the final amount based on locally stored tax and discount rules.
6. The cashier tells the final amount to the customer
7. Customer selects a payment method and the cashier processes the payment.
8. Once the payment is successful, the system deducts the sold items from the inventory.
9. The system prints a receipt for the customer.
10. The sale is recorded in the database.

Post Condition:

- The sale is logged in the POS system.
- Inventory is updated to reflect the sold items.

Alternate Flow:

- 2.1 **Barcode Scan Error:** System prompts an error and cashier manually enters the code.
- 2.2 **Remove an item:** Cashier removes the item from the list and the bill is updated.
- 4.1 **Amount mismatch:** The customer updates
- 7.1 **Promotional Coupons:** Customer presents a coupon to the cashier and cashier enters/scans the code and the amount is updated.
- 7.2 **Payment Failure:** The customer's card payment is declined, and the cashier requests an alternative payment method.

2. Identify Entity/Boundary Control Objects Entity

Objects:

- Product
- Inventory System
- Cashier
- Customer
- Receipt
- Payment

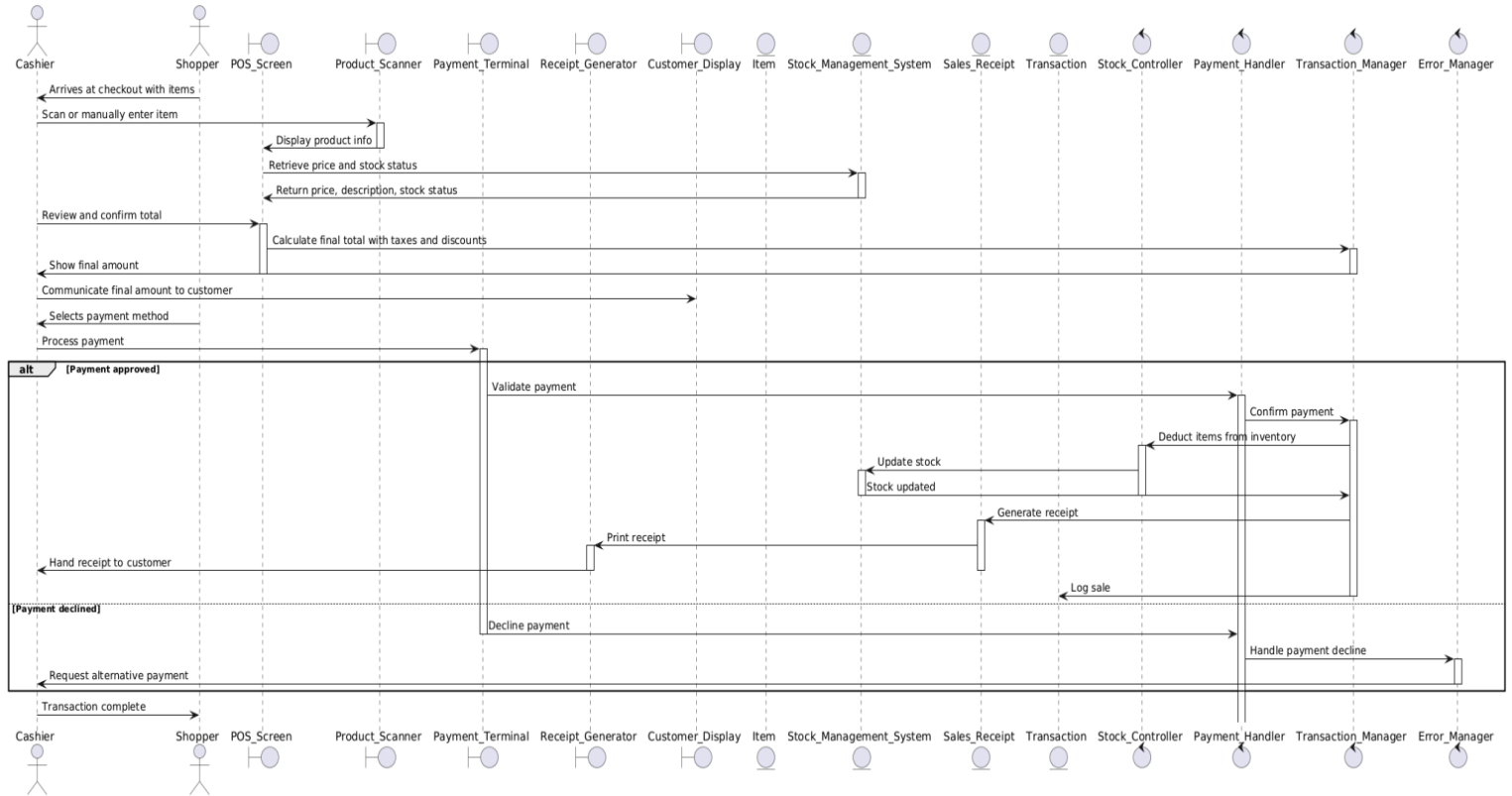
Boundary Objects:

- POS Interface
- Barcode Scanner
- Card Reader
- Receipt Printer
- Display

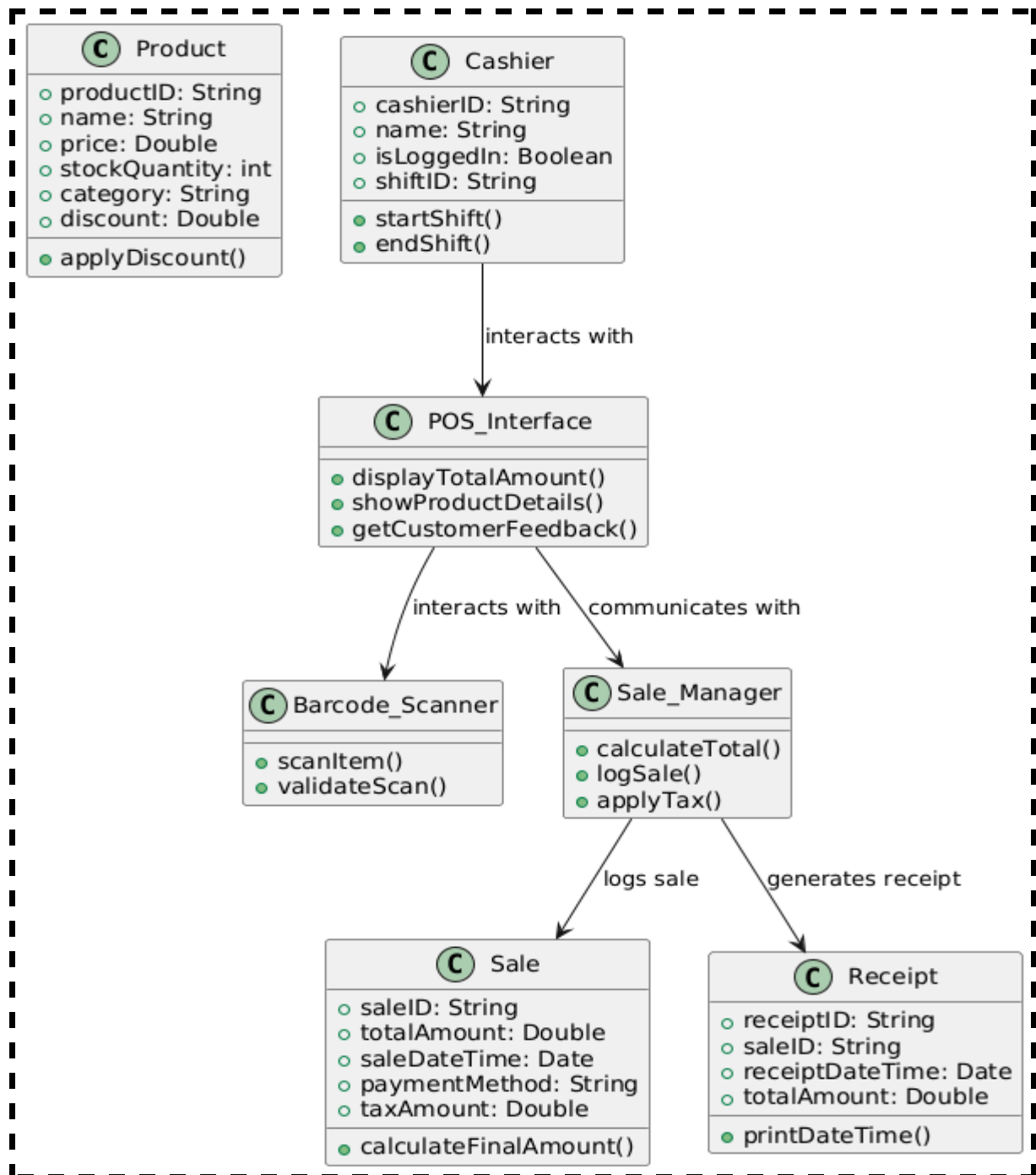
Control Objects:

- Inventory Manager
- Payment Processor
- Sale manager
- Error Handler

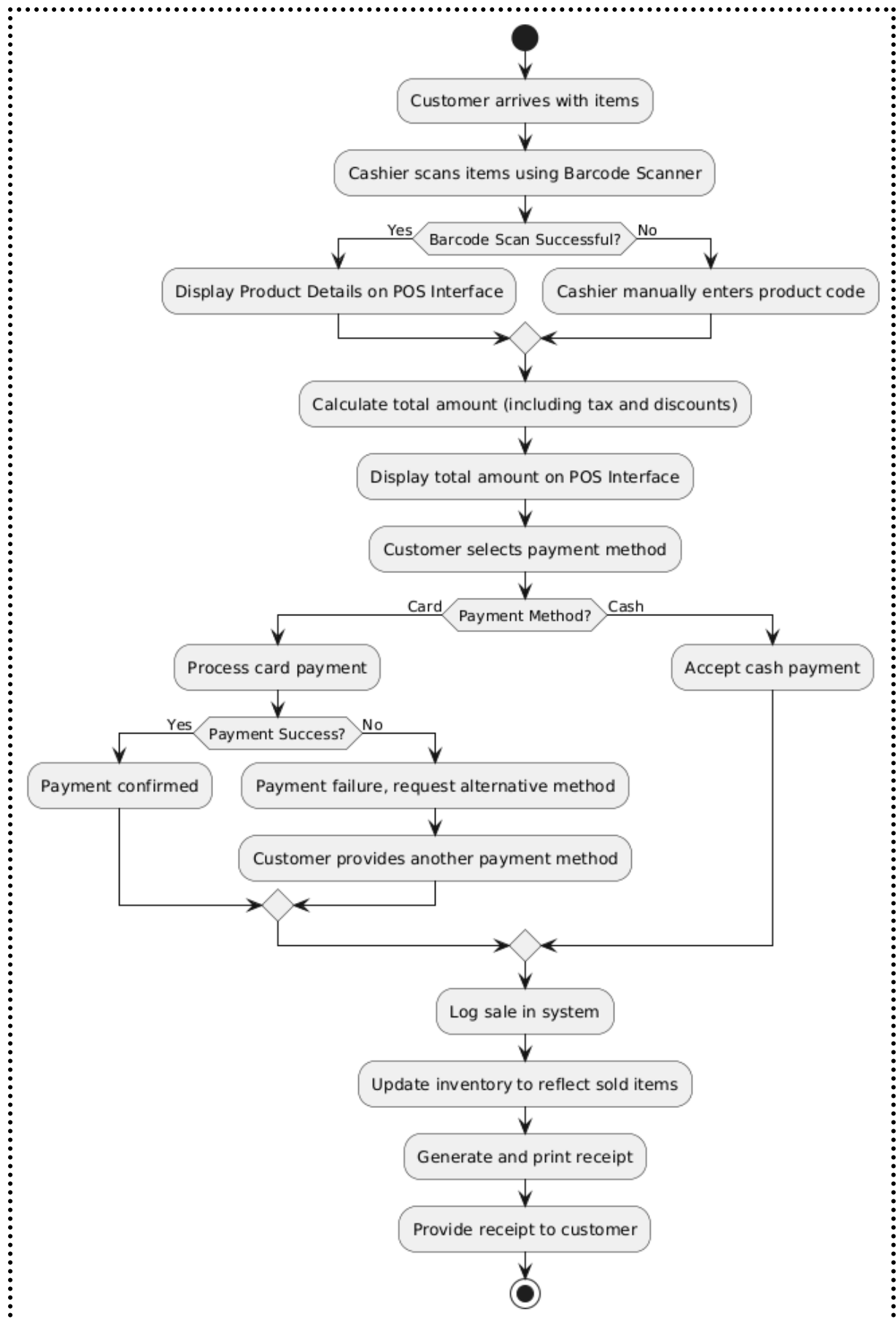
Sequence Diagram:



4. Develop Analysis Domain Models



5. Develop activity diagram



Handle Returns

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

Use Case: Handle Returns

Actor: Cashier

Precondition:

- The POS system is operational.
- The customer provides a valid receipt or proof of purchase.
- Sales data is accessible.

Flow:

1. The customer requests a return.
2. The cashier manually searches for the sale in the local database using the receipt or transaction ID.
3. The system verifies if the items are eligible for return based on the store policy.
4. The cashier confirms the return and processes it.
5. The system calculates the refund based on the original transaction (refund will likely be cash-based since online payment methods may not be accessible).
6. The system updates the local inventory and stores the return transaction locally.
7. A return receipt is printed for the customer.

Postcondition:

- The return is recorded in the local database.
- Local inventory is updated to reflect the returned items.
- The system waits to sync with the central server once connectivity is restored.

Alternate Flow:

2.1 Product Not Found in the System: The system prompts an error indicating the product cannot be found in the database, and the cashier manually verifies the purchase receipt.

3.1 No Receipt Available: The customer does not have a receipt, so the cashier requests alternate proof of purchase (e.g., loyalty account, card transaction, etc.).

4.1 Item Condition Not Acceptable: The item is damaged or not in acceptable return condition, and the cashier informs the customer of the return policy.

5.1 Partial Refund or Exchange: Instead of a full refund, the customer opts for an exchange or partial refund based on the store's return policy.

6.1 Payment Method Mismatch: The customer requests the refund via a different payment method (e.g., wants cash for a card transaction), but the system only allows the refund to the original payment method.

7.1 System Error During Refund: A system error occurs during the refund process, and the cashier manually processes the refund or issues store credit to the customer.

2. Identify Entity/Boundary Control Objects

Entity Objects:

1. Product
2. Receipt
3. Return
4. Refund
5. Inventory System
6. Customer
7. Cashier

Boundary Objects:

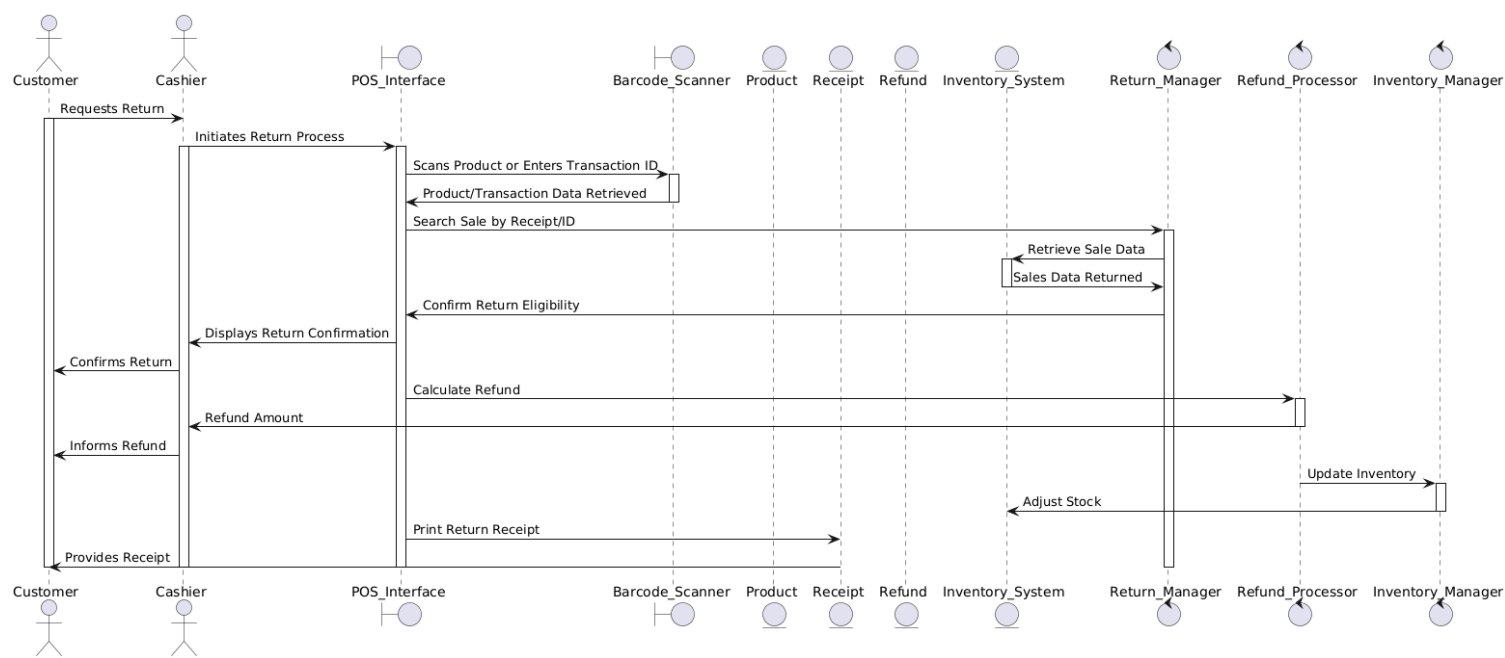
1. POS Interface

- 2. Barcode Scanner
- 3. Display

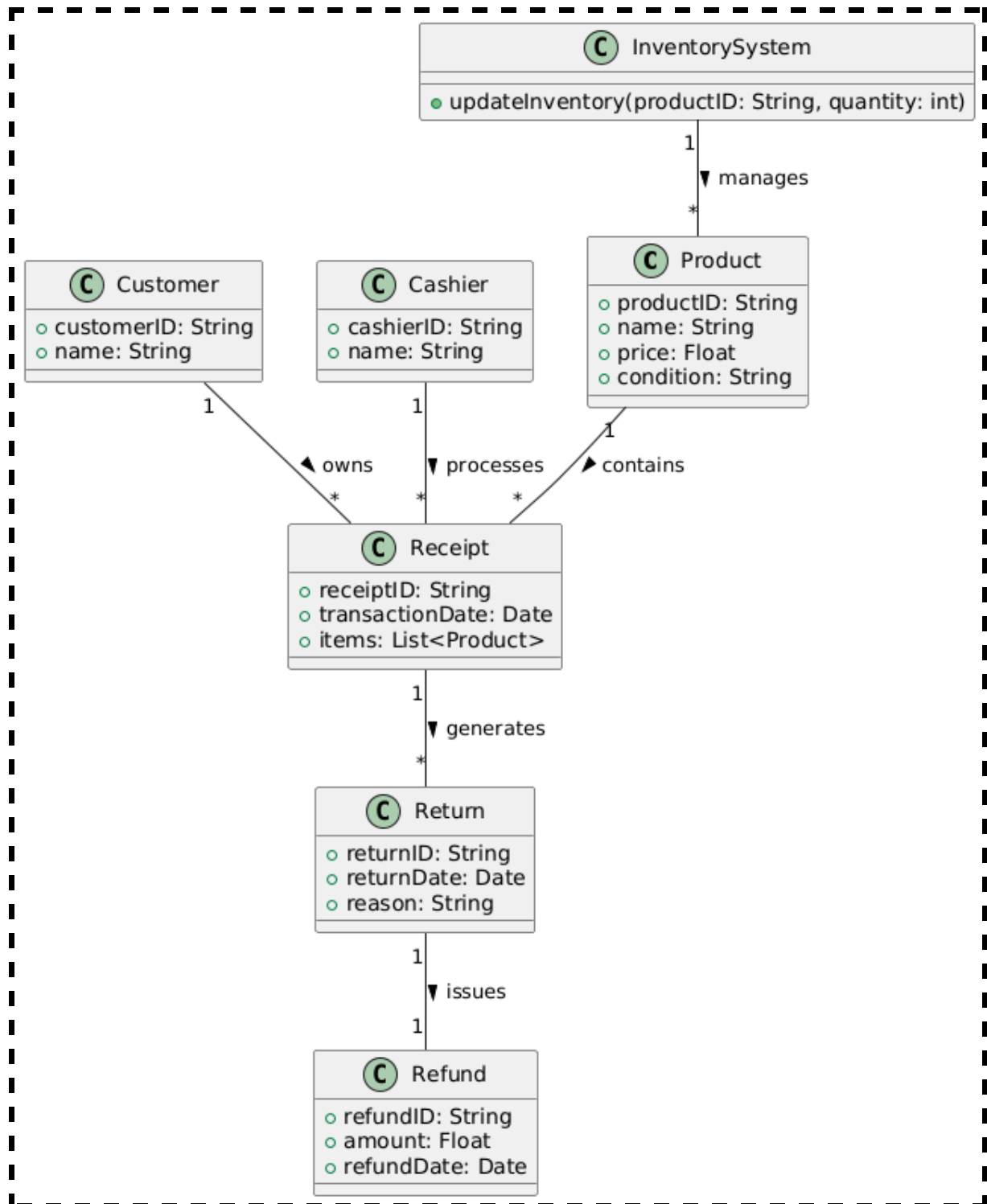
Control Objects:

- 1. Return Manager
- 2. Refund Processor
- 3. Inventory Manager

Sequence Diagram



Develop Analysis Domain Models



Activity Diagram

