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

Ram Kulkarni
202201354

A Problem Description:

A POS (Point-Of-Sale) system is a computer system typically used to manage the sales in retail stores. It includes hardware components such as a computer, a bar code scanner, a printer and also software to manage the operation of the store. The most basic function of a POS system is to handle sales. When a customer arrives at a POS counter with goods to purchase, the cashier will start a new sale transaction. When the barcode of a good is read by the POS system, it will retrieve the name and price of this good from the backend catalog system and interact with inventory system to deduce the stock amount of this good. When the sale transaction is over, the customer can pay in cash, credit card or even check. After the payment is successful, a receipt will be printed. Note that for promotion, the store frequently issue gift coupons. The customer can use the coupons for a better price when purchasing goods. Another function of a POS system is to handle returns…. [The details of which are not given here] A user must log in to use the POS. The users of a POS system are the employees of the store including cashiers and the administrator. The administrator can access the system management functions of the POS system including user management and security configuration that cashiers can’t do.

Use Case: Process Sale

Actors: Cashier

Preconditions:

- The cashier must be logged into the system with valid credentials.
- The items to be purchased must be available in the inventory.

Description:

1. A customer approaches the POS counter with items they wish to buy.
2. The cashier starts a new sales transaction in the system.
3. The cashier scans the barcode of each item brought by the customer.
4. The system retrieves details of each item from the catalog, recording the sale line item and displaying the item description, price, and the current total. The cashier continues scanning items until all are added.
5. The system computes and shows the final price for all items.
6. The cashier can apply any relevant gift coupons to provide discounts.
7. The system calculates and presents the total amount due after discounts.
8. The customer completes the payment using cash, a credit card, or a check.
9. The system processes the payment and confirms the transaction.
10. The inventory is updated to reflect the deducted stock for sold items.
11. A receipt is generated and printed for the customer.
12. The customer leaves with their receipt and purchased items.

Postconditions:

- The transaction is finalized, and inventory levels are adjusted.
- A receipt is issued to the customer.

Alternate Flow:

- 3a: If the barcode cannot be scanned, the cashier manually enters the item details.
- 8a: If a payment fails, any deducted funds are refunded, and the system prompts for another payment attempt.

- 10a: If stock for an item falls below 5 units, a reorder prompt appears in the POS.

❖ Entity/Boundary Control Objects

Entities:

- Item catalog
- Inventory database
- Transaction Database
- Cashier
- Coupon
- Sale Receipt

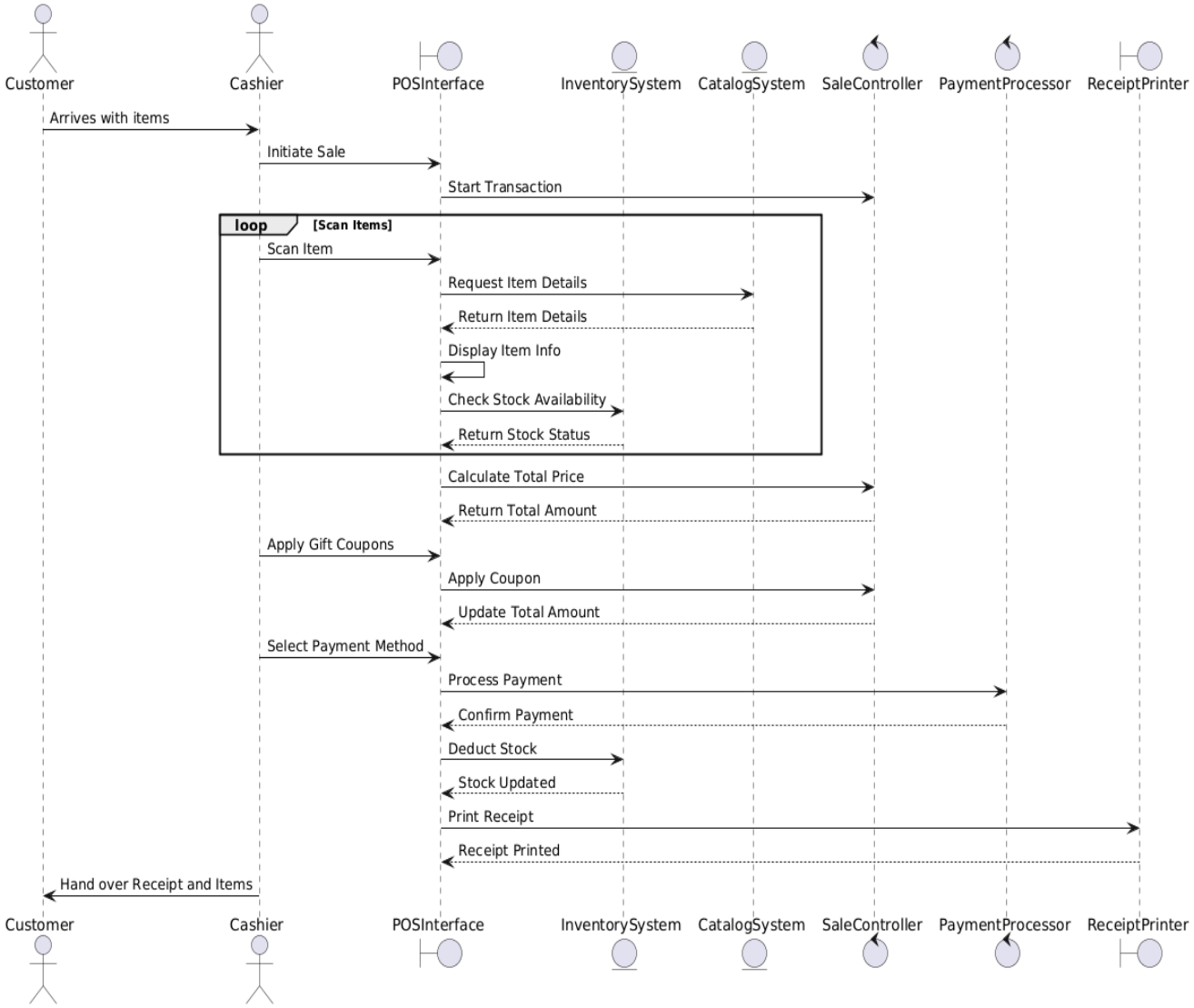
Boundary Objects:

- POS Interface
- Payment interface
- Barcode scanner
- Printer

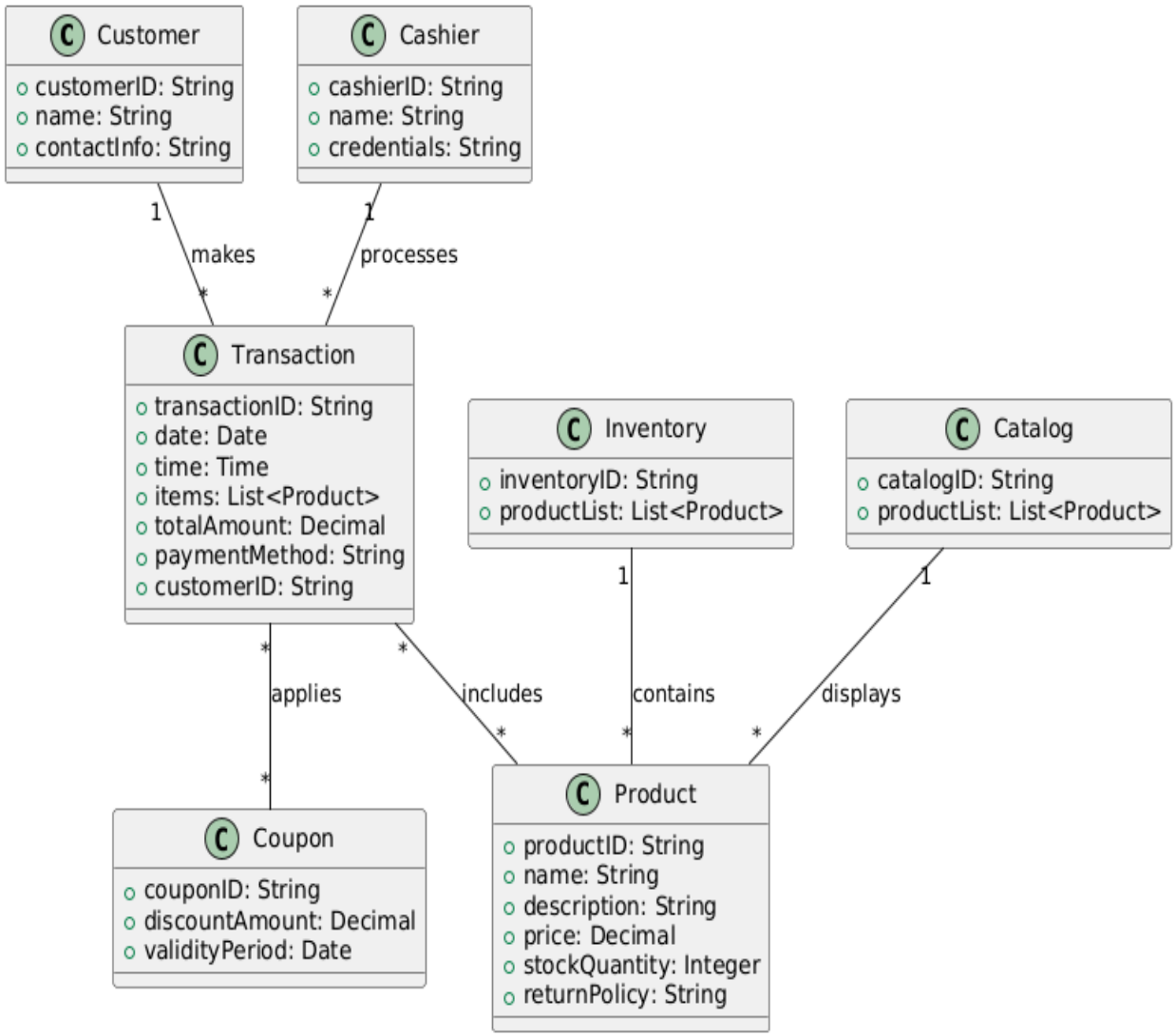
Control Objects:

- ItemController
- InventoryController
- PaymentController

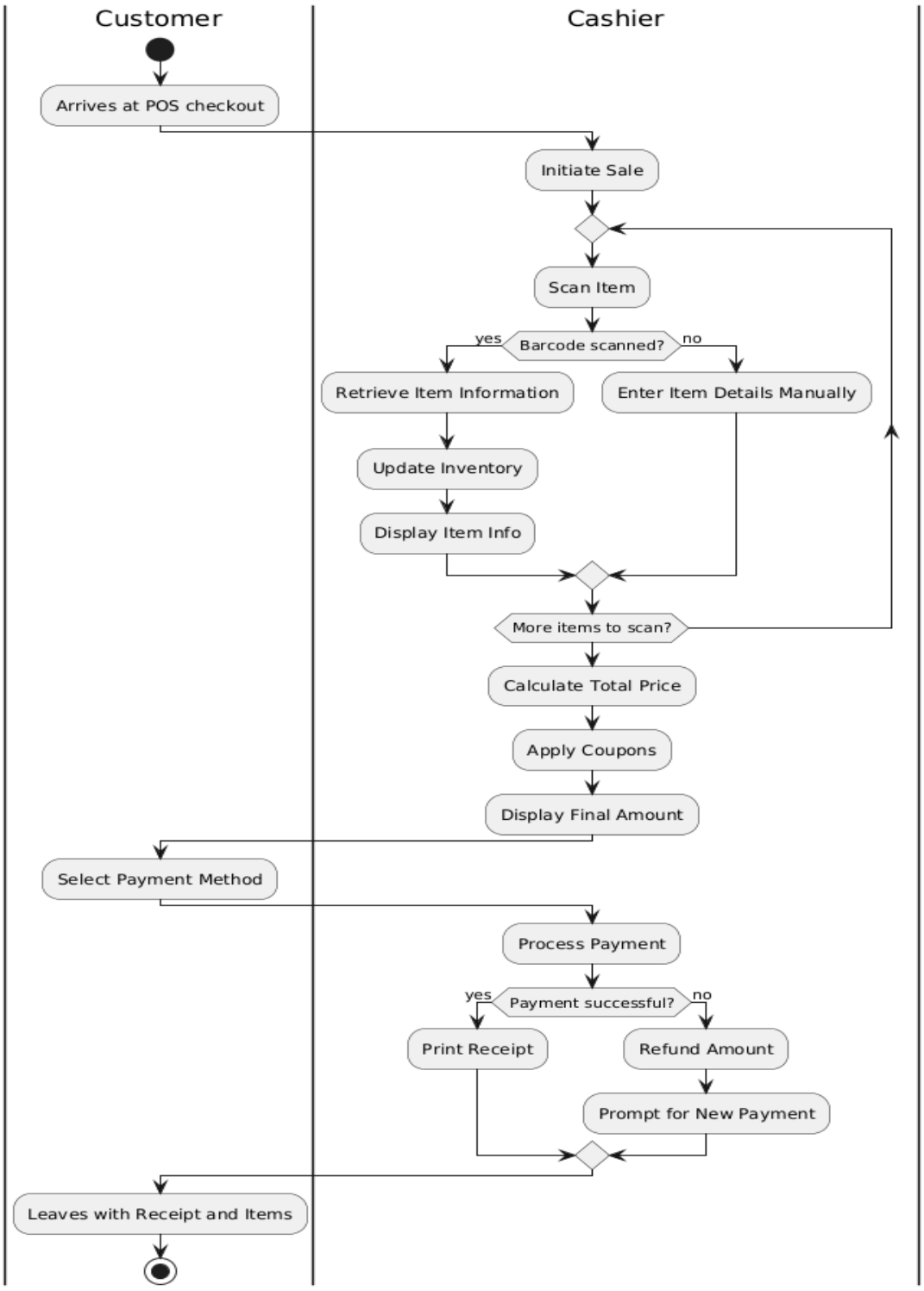
❖ Sequence Diagram:



❖ Analysis Domain Models



❖ Activity Diagram



Use Case: Handle Return

Actors: Cashier, Customer

Preconditions:

Cashier must be authenticated and logged into the system.

Description:

- Customer arrives at the POS checkout with goods to return.
- The cashier initiates a return transaction.
- The cashier scans the barcode of the original receipt of the item being returned.
- The system verifies the purchase details (original transaction).
- The system checks if the items in the receipt are eligible for return.
- The system calculates any refunds or store credit or vouchers.
- The cashier processes the return and the system updates the inventory, adding the stock amount.
- A return receipt is printed for the customer. Postconditions:
- Transaction is completed, and inventory is updated. Receipt for the return is printed.

Alternate Flow:

- 3a.The barcode could not be scanned properly hence the cashier checks the original receipt number by manually entering it.
- 4a. The receipt is not found in records due to which the session will be terminated.
- 5a. The items in the receipt are not eligible for return due to which the session will get terminated. change languauge a bit to avoid to plagiarism

❖ Entity/Boundary Control Objects:

Entities:

- Item catalog
- Transaction Database
- Inventory database
- Cashier
- Customer
- Store Credit/Coupons
- Return Receipt

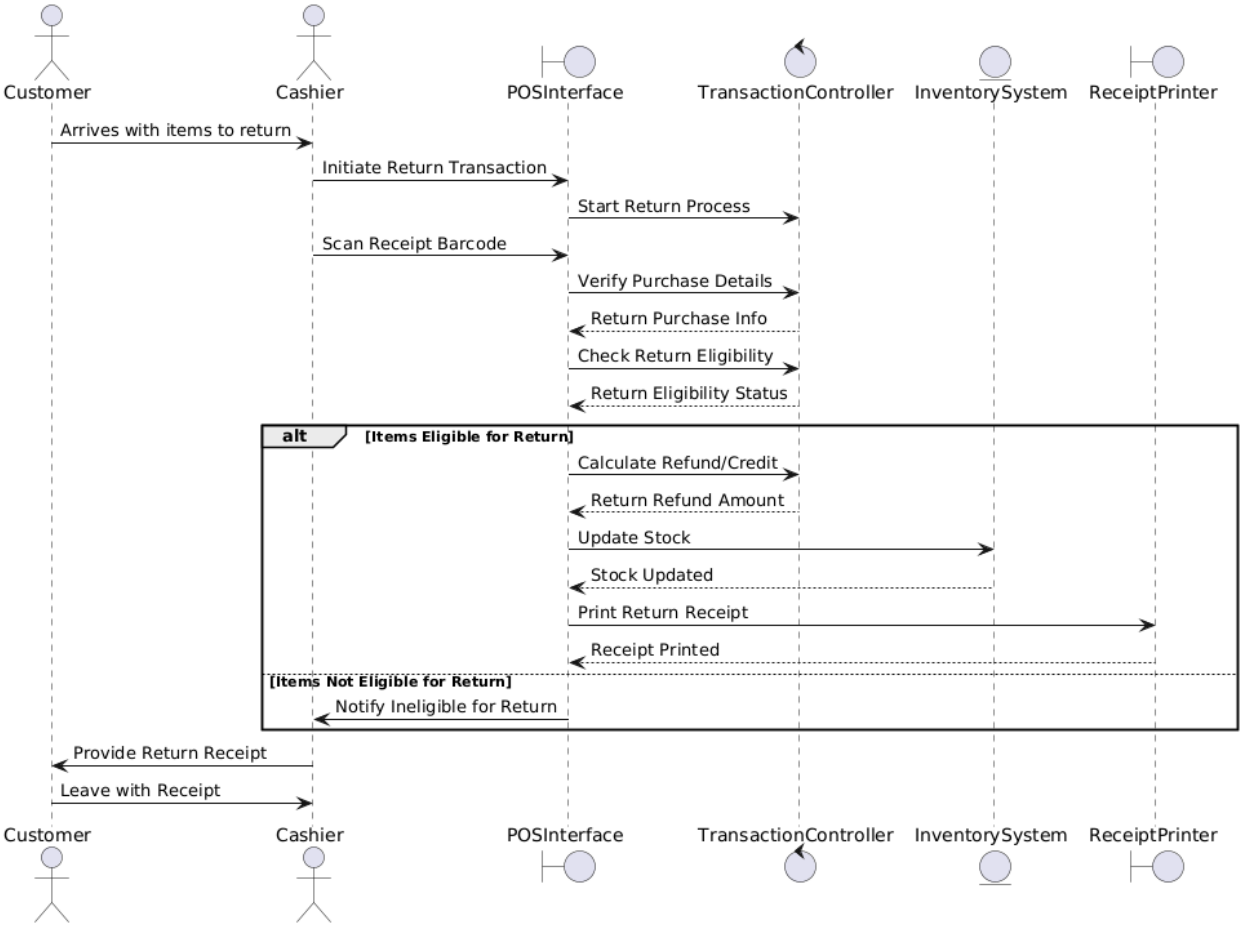
Boundary Objects:

- POS Interface
- Payment interface (Card reader etc)
- Barcode scanner
- Printer

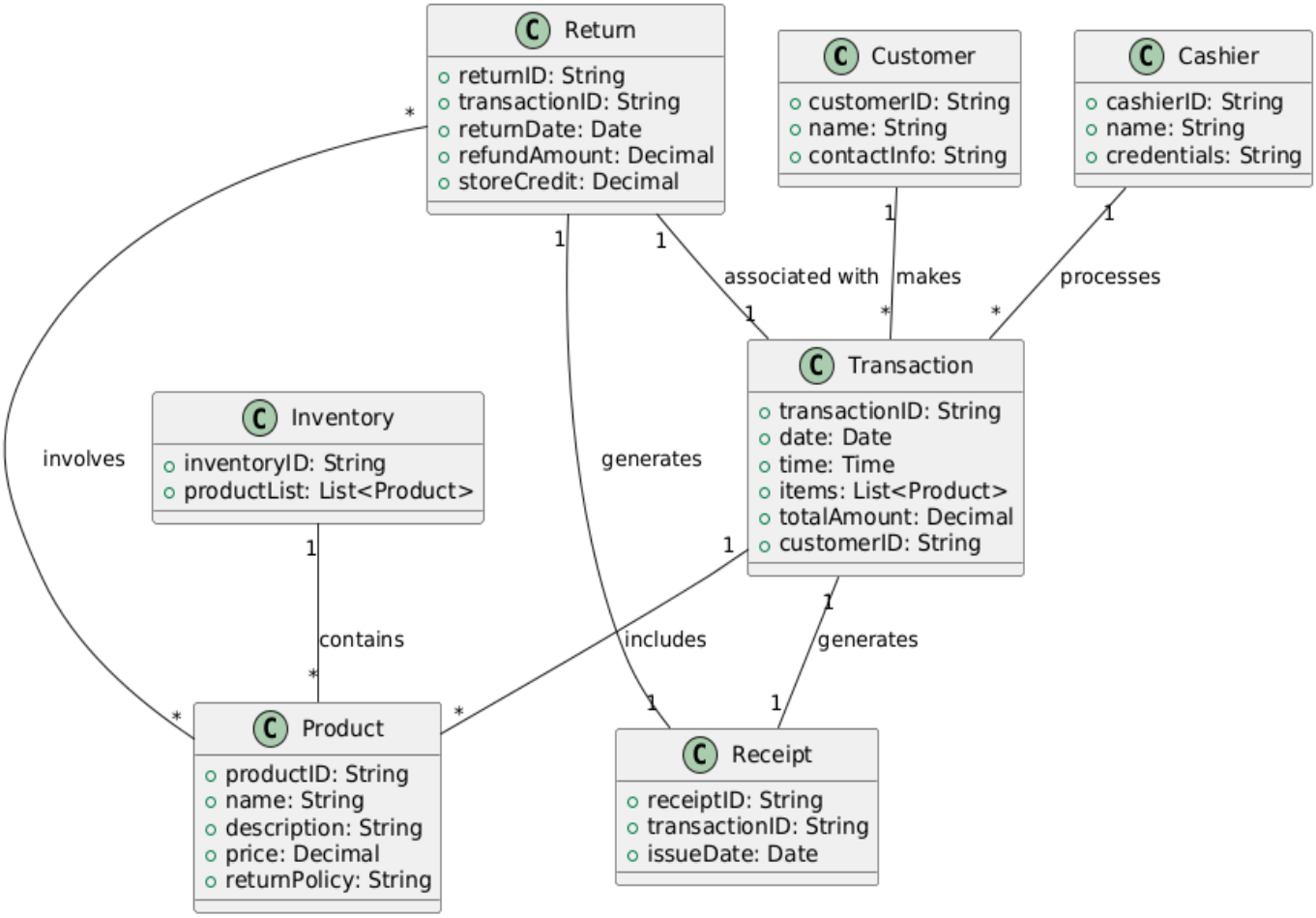
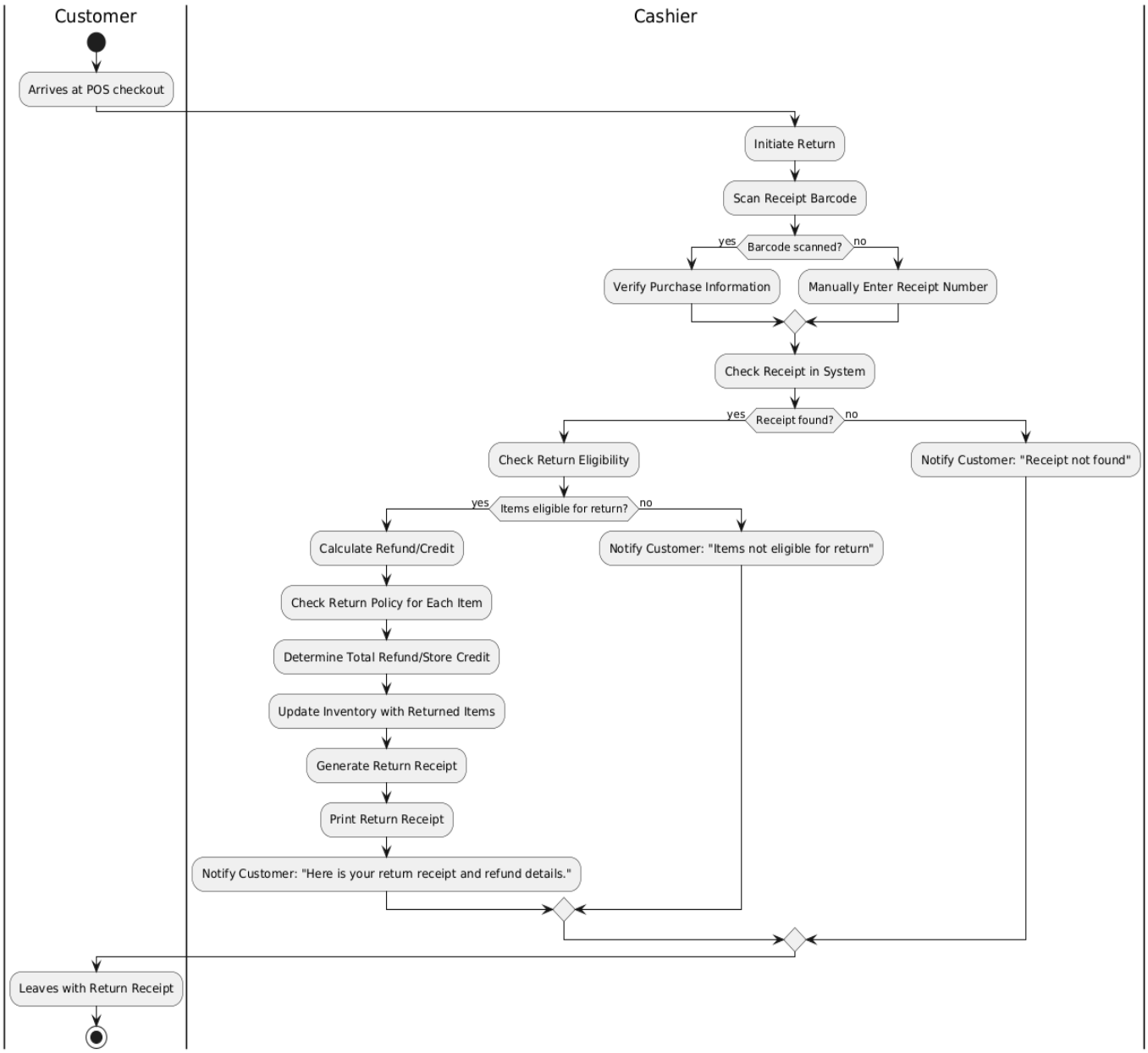
Control Objects:

- ReturnController
- InventoryController
- PaymentController

❖ Sequence Diagram:



❖ Analysis Domain Models



❖ Activity Diagram