IT 314
SOFTWARE ENGINEERING

LAB - 6

[Modeling Class Diagram and Activity Diagram (Point of Sale System)]

Name: Divyesh Ramani
ID: 202201241

Q. Develop a textual description for "process sale" and "handle return" use cases.

★ Process Sale:

Use Case: Process Sale

Actors: Cashier

Preconditions:

- The cashier is logged into the store's Point of Sale (POS) system.
- Payment systems, such as card readers, are either connected or ready for offline cash transactions.

Basic Flow:

1. The customer brings their items.
2. The cashier either scans or manually inputs the items to be purchased.
3. The POS system fetches the price, description, and availability from the database.
4. The cashier verifies the total cost, accounting for taxes or discounts.
5. The system computes the final amount using locally stored tax and discount rules.
6. The cashier informs the customer of the total.
7. The customer chooses a payment method, and the cashier processes the payment.
8. After payment is confirmed, the system updates the inventory to reflect the sold items.
9. A receipt is printed for the customer.
10. The sale is saved in the POS system.

Postconditions:

- The sale is logged in the POS system.
- The inventory is updated to reflect the sold products.

Alternate Flow:

- **Step 2.1 Barcode Scan Error:**
  The system alerts the cashier, who then manually enters the product code.
- **Step 2.2 Remove an Item:**
  The cashier removes an item, and the bill is recalculated.
- **Step 4.1 Amount Mismatch:**
  The customer requests an update.
- **Step 7.1 Promotional Coupons:**
  The customer presents a coupon, which the cashier scans or enters, adjusting the total amount.
- **Step 7.2 Payment Failure:**
  If the payment method is declined, the cashier requests an alternative payment method.

Entity Objects:

1. **Inventory System**
2. **Cashier**
3. **Receipt**
4. **Catalog System**

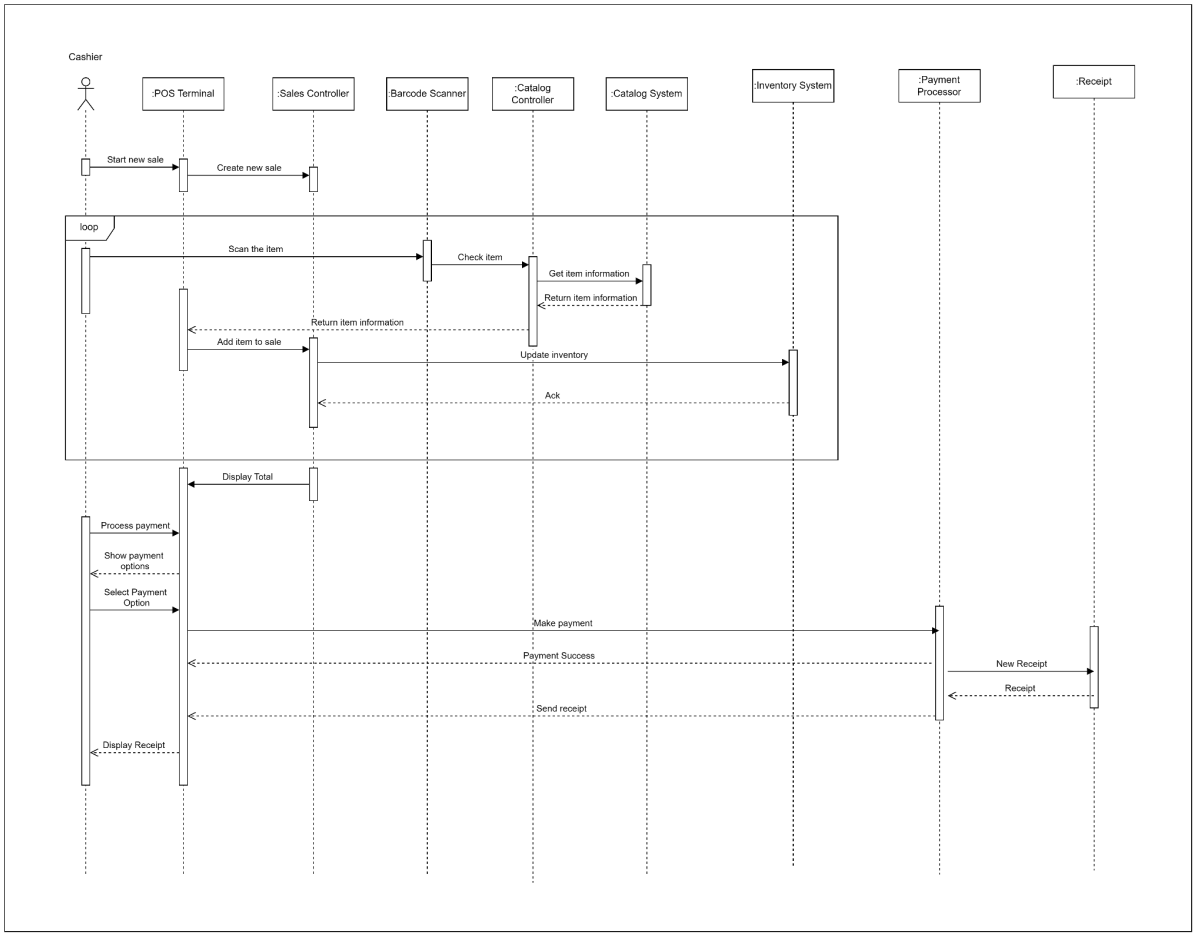
Boundary Objects:

1. **POS Interface**
2. **Barcode Scanner**

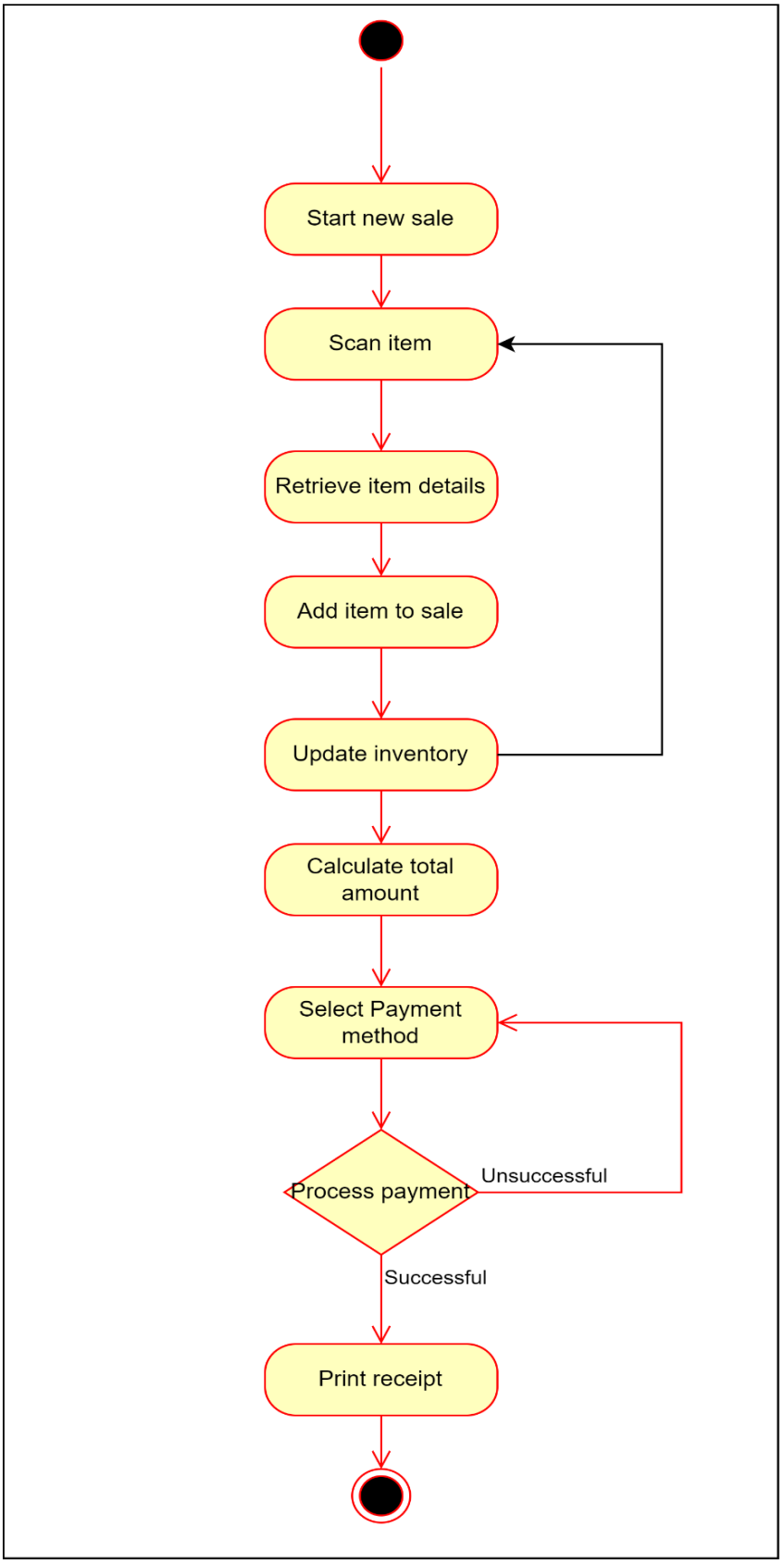
Control Objects:

1. **Catalog Manager**
2. **Payment Processor**
3. **Sales Controller**

SEQUENCE DIAGRAM:



ACTIVITY DIAGRAM:



★ Handle Returns

Use Case: Handle Returns

Actor: Cashier

Preconditions:

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

Main Flow:

1. **Customer initiates a return request.**
2. **Cashier locates the transaction** in the local database by searching with the receipt or transaction ID.
3. **System checks return eligibility** based on store policy.
4. **Cashier confirms and processes the return.**
5. **System calculates refund amount** based on the original purchase.
6. **System updates inventory** to reflect the returned items and stores the return transaction locally.
7. **Return receipt is printed** for the customer.

Postconditions:

- The return is recorded in the local database.
- Inventory is updated to reflect returned items.
- The system awaits synchronization with the central server when connectivity is restored.

Alternate Flows:

- **2.1 Product Not Found in the System:**
  If the product is not located in the database, the system displays an error, prompting the cashier to manually verify the receipt.
- **3.1 No Receipt Available:**
  If the customer does not have a receipt, the cashier requests other proof of purchase, such as a loyalty account or card transaction details.
- **4.1 Item Condition Not Acceptable:**
  If the returned item is damaged or otherwise unacceptable for return, the cashier informs the customer of the store's return policy.
- **5.1 Partial Refund or Exchange:**
  If the customer opts for an exchange or partial refund as per store policy, the system processes it accordingly.
- **6.1 Payment Method Mismatch:**
  If the customer requests a refund through a different payment method (e.g., cash for a card payment) but the system only allows refunds to the original payment method.

- **7.1 System Error During Refund:**
  In the event of a system error during the refund process, the cashier manually processes the refund or issues store credit to the customer.

Entity Objects:

1. **Return Receipt**
2. **Inventory System**
3. **Cashier**

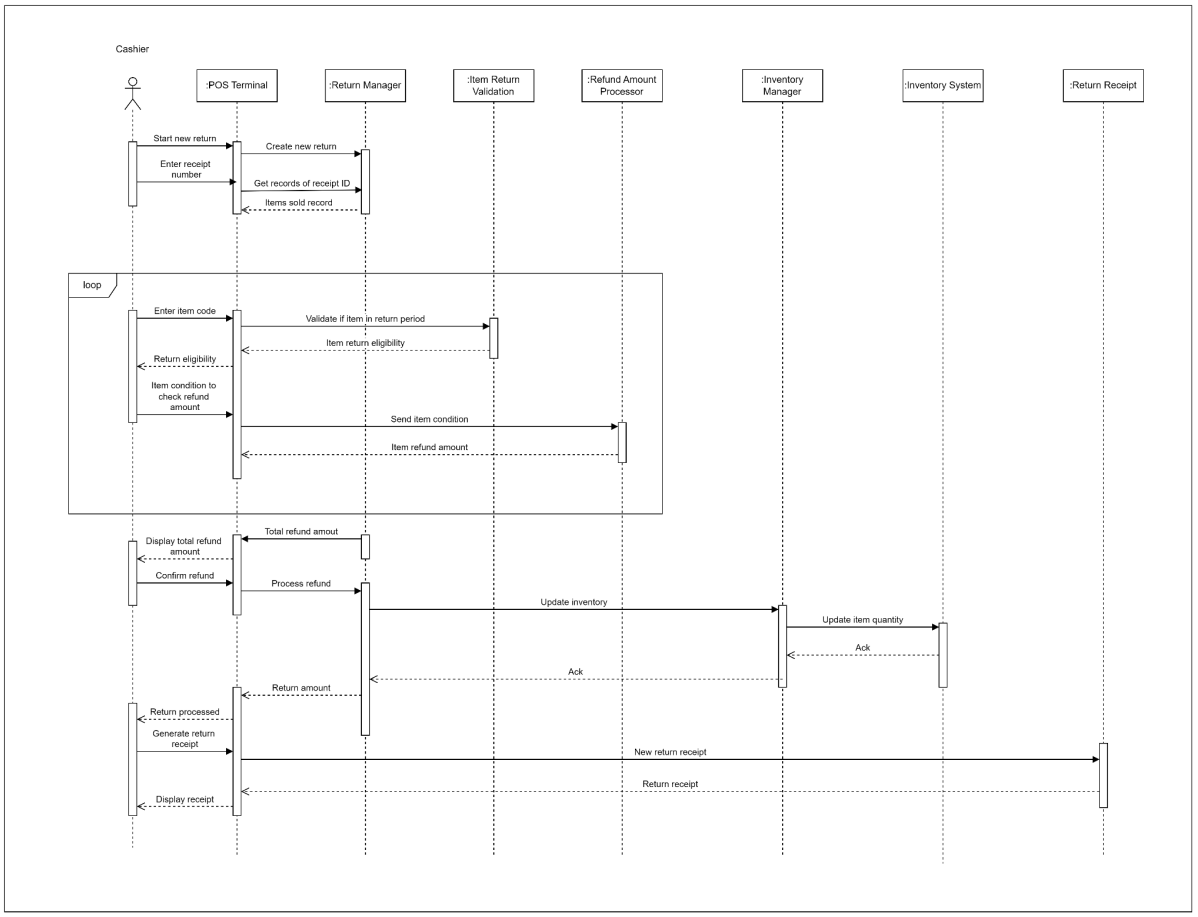
Boundary Objects:

1. **POS Interface**

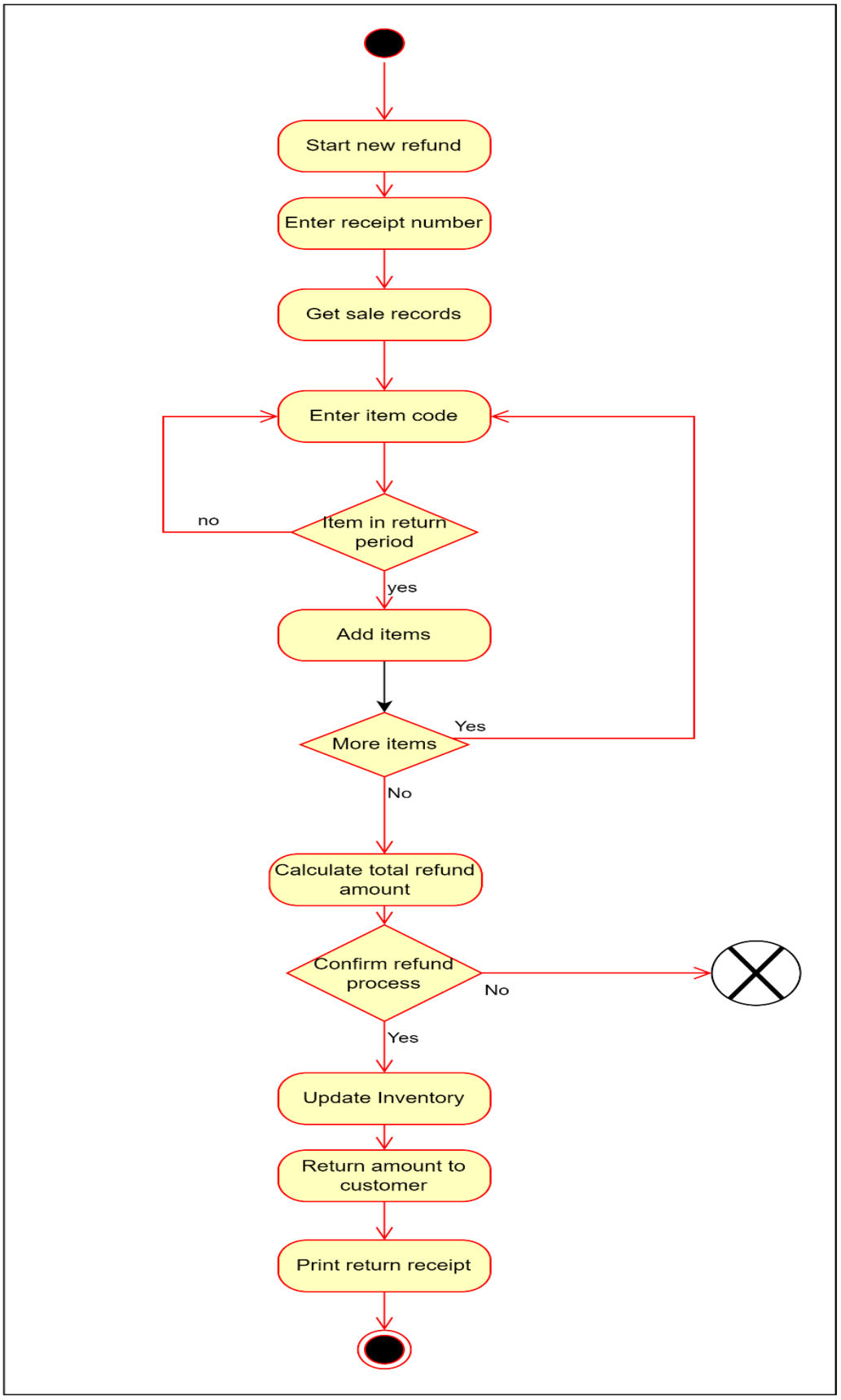
Control Objects:

1. **Return Manager**
2. **Refund Amount Processor**
3. **Inventory Manager**
4. **Item Return Validation**

SEQUENCE DIAGRAM:



ACTIVITY DIAGRAM:



CLASS DIAGRAM: