Priyank asodariya - 202201470
Lab6 IT314

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

Use Case: Process Sale

Actor
Primary Actor: Cashier
Secondary Actor: Customer

Preconditions
1. Cashier is logged into the POS system
2. POS system is connected to the catalog and inventory systems

Main Success Scenario
1. Customer arrives at POS counter with goods to purchase
2. Cashier initiates a new sale transaction
3. For each item:
   3.1. Cashier scans item barcode
   3.2. System retrieves item details (name, price) from catalog
   3.3. System updates inventory count
   3.4. System adds item to current transaction
4. System calculates total price
5. Cashier informs customer of total price
6. Customer chooses payment method (cash, credit card, or check)
7. Cashier processes payment
8. System records the sale
9. System prints receipt
10. Cashier gives receipt and purchased items to customer

Alternate Flows
4a. Customer has a gift coupon
   1. Cashier applies coupon to the transaction
   2. System recalculates total price with discount
   3. Return to step 5

6a. Customer decides not to complete purchase
   1. Cashier cancels the transaction
   2. System reverts inventory changes

3. Use case ends

7a. Payment is declined
1. System displays error message
2. Cashier informs customer
3. Return to step 6 or 6a

Postconditions
1. Sale is recorded in the system
2. Inventory is updated
3. Payment is processed (if sale completed)

Use Case: Handle Return

Actor
Primary Actor: Cashier
Secondary Actor: Customer

Preconditions
1. Cashier is logged into the POS system
2. Customer has items to return and original receipt

Main Success Scenario
1. Customer arrives at POS counter with items to return and receipt
2. Cashier initiates a new return transaction
3. Cashier enters or scans receipt number
4. System retrieves original sale information
5. For each item to be returned:
   5.1. Cashier scans item barcode
   5.2. System verifies item was part of the original sale
   5.3. System calculates refund amount for the item
   5.4. System adds item to current return transaction
6. System calculates total refund amount
7. Cashier verifies returned items' condition
8. Cashier processes refund using original payment method
9. System updates inventory
10. System records the return transaction
11. System prints return receipt
12. Cashier gives return receipt and refund to customer

Alternate Flows
5a. Item not found in original sale
1. System displays error message

2. Cashier informs customer item cannot be returned
3. Continue with next item or proceed to step 6

7a. Item condition not acceptable for return
1. Cashier informs customer item cannot be returned
2. System removes item from return transaction
3. Continue with next item or proceed to step 6

8a. Original payment method not available
1. Cashier selects alternative refund method (store credit or cash)
2. Continue to step 9

Postconditions
1. Return is recorded in the system
2. Inventory is updated
3. Refund is processed

Q.2 Identify Entity/Boundary Control Objects

Entity Objects:

- Sale
- Item
- Payment
- Customer
- Employee (Cashier, Administrator)
- Inventory
- Coupon
- Return

Boundary Objects:

- POS Terminal Interface
- Barcode Scanner
- Payment Terminal
- Receipt Printer

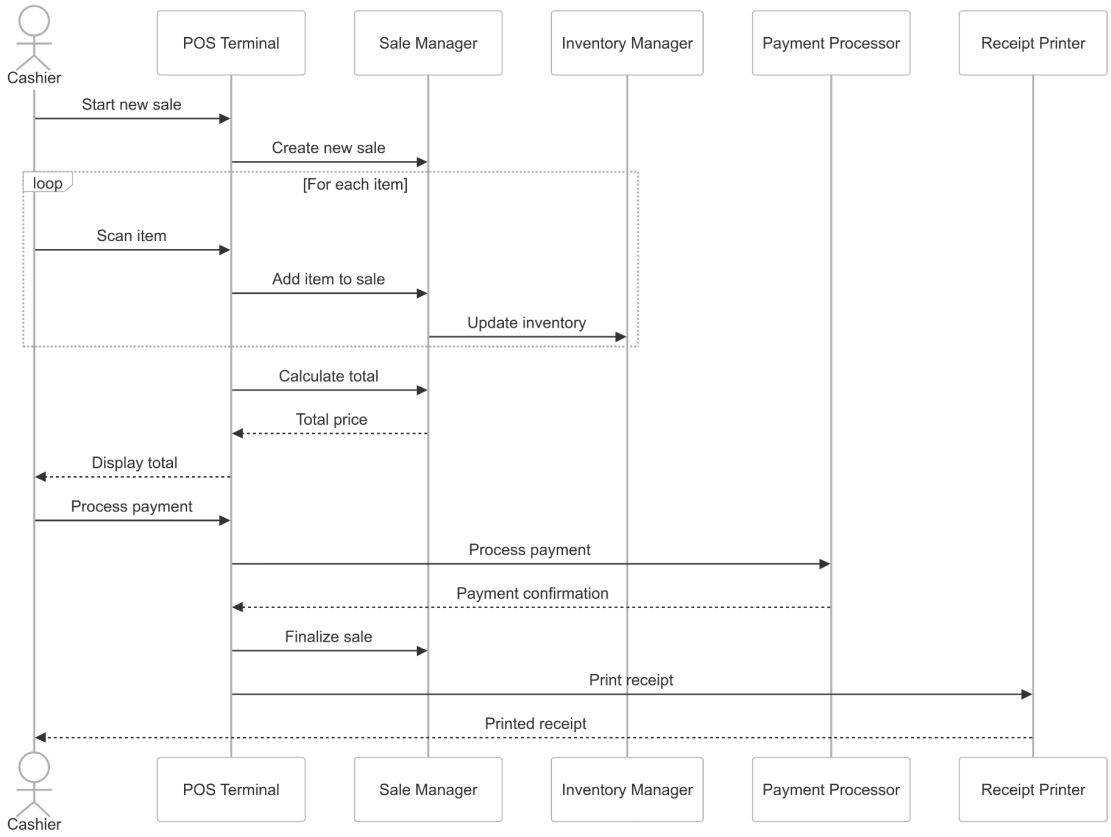
Control Objects:

- Sale Manager
- Inventory Manager
- Payment Processor

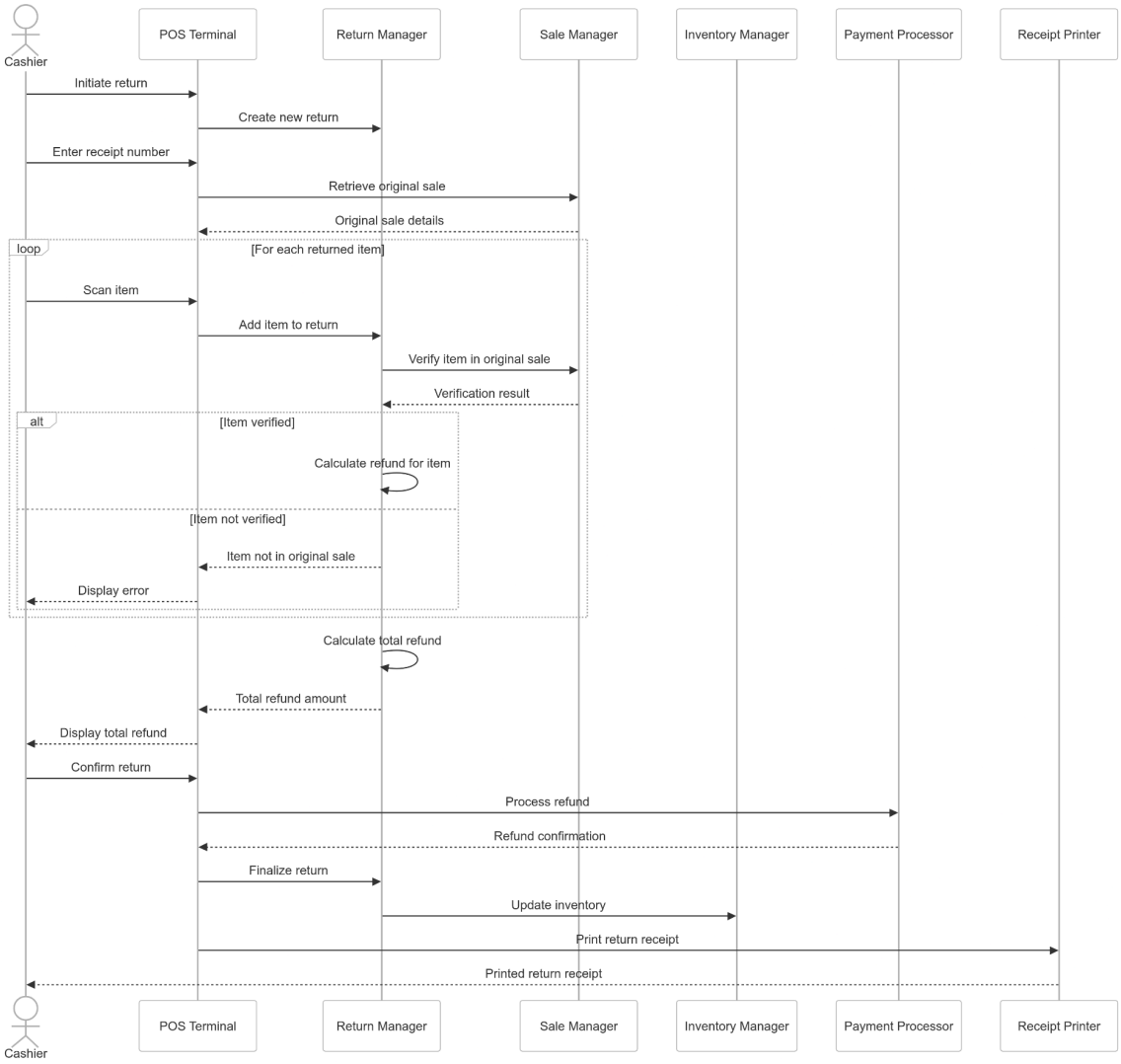
- User Authentication Controller
- Return Manager

Q.3 Develop Sequence Diagrams

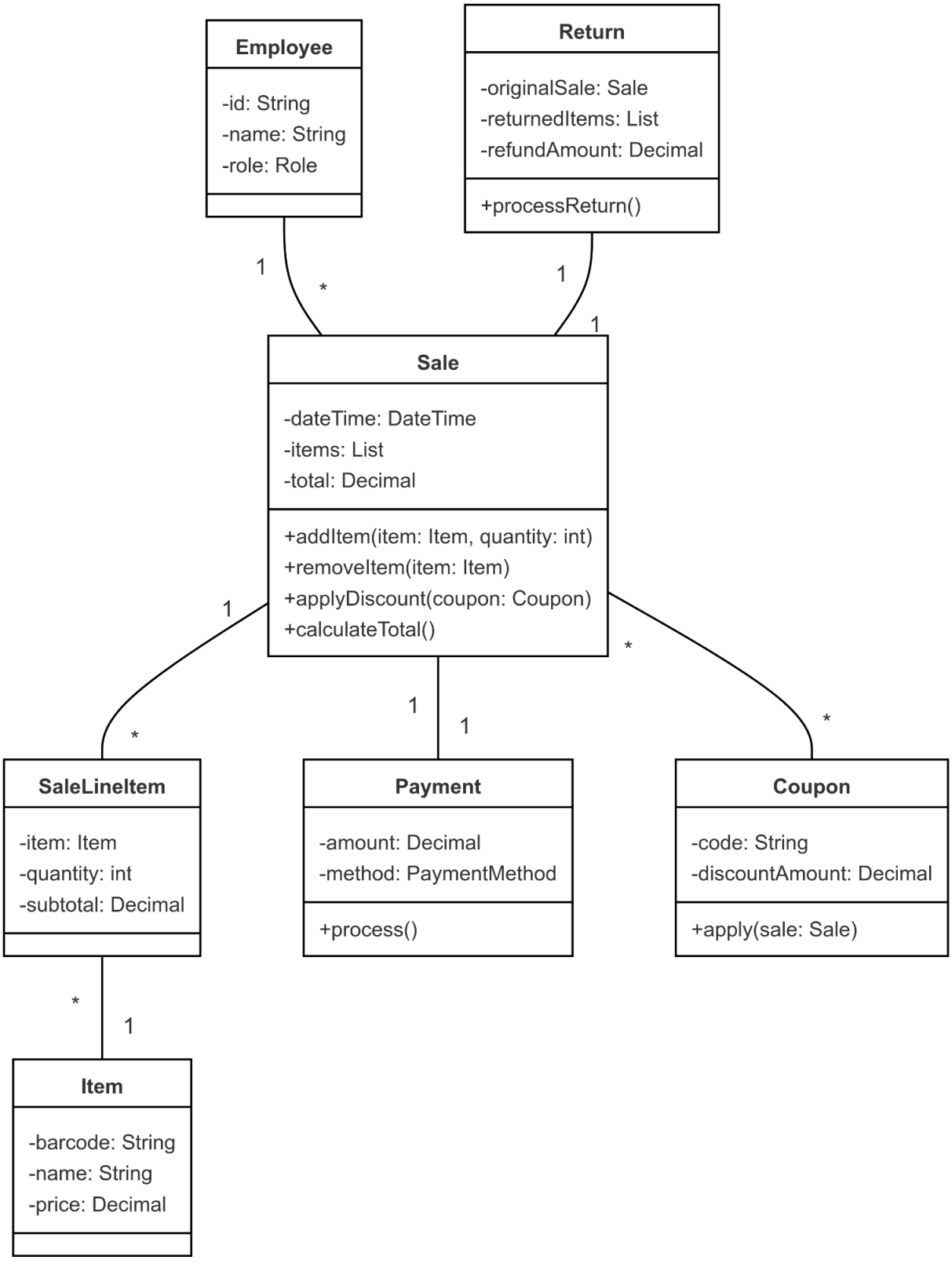
Sequence diagram for process sale:



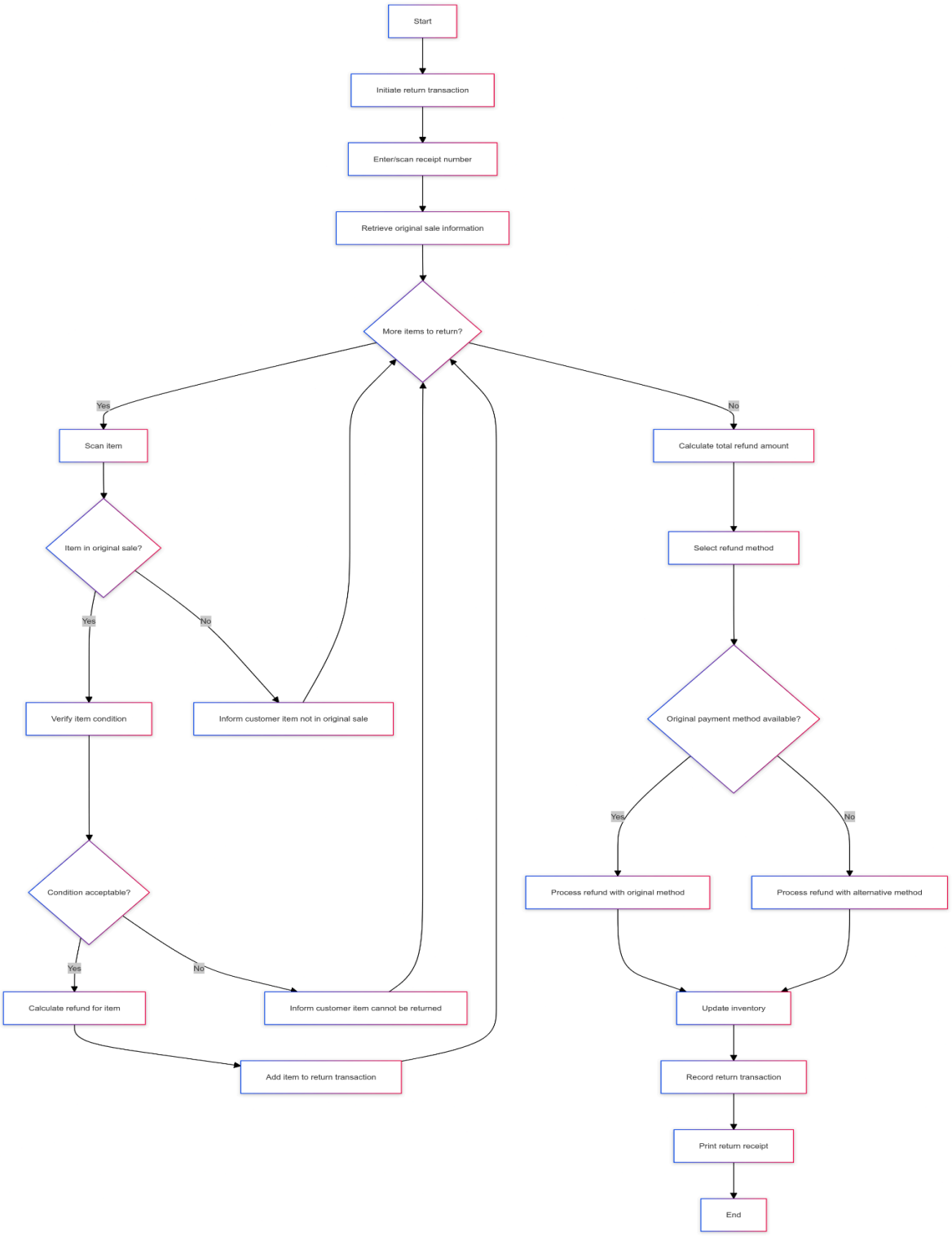
Sequence diagram for Handle return:

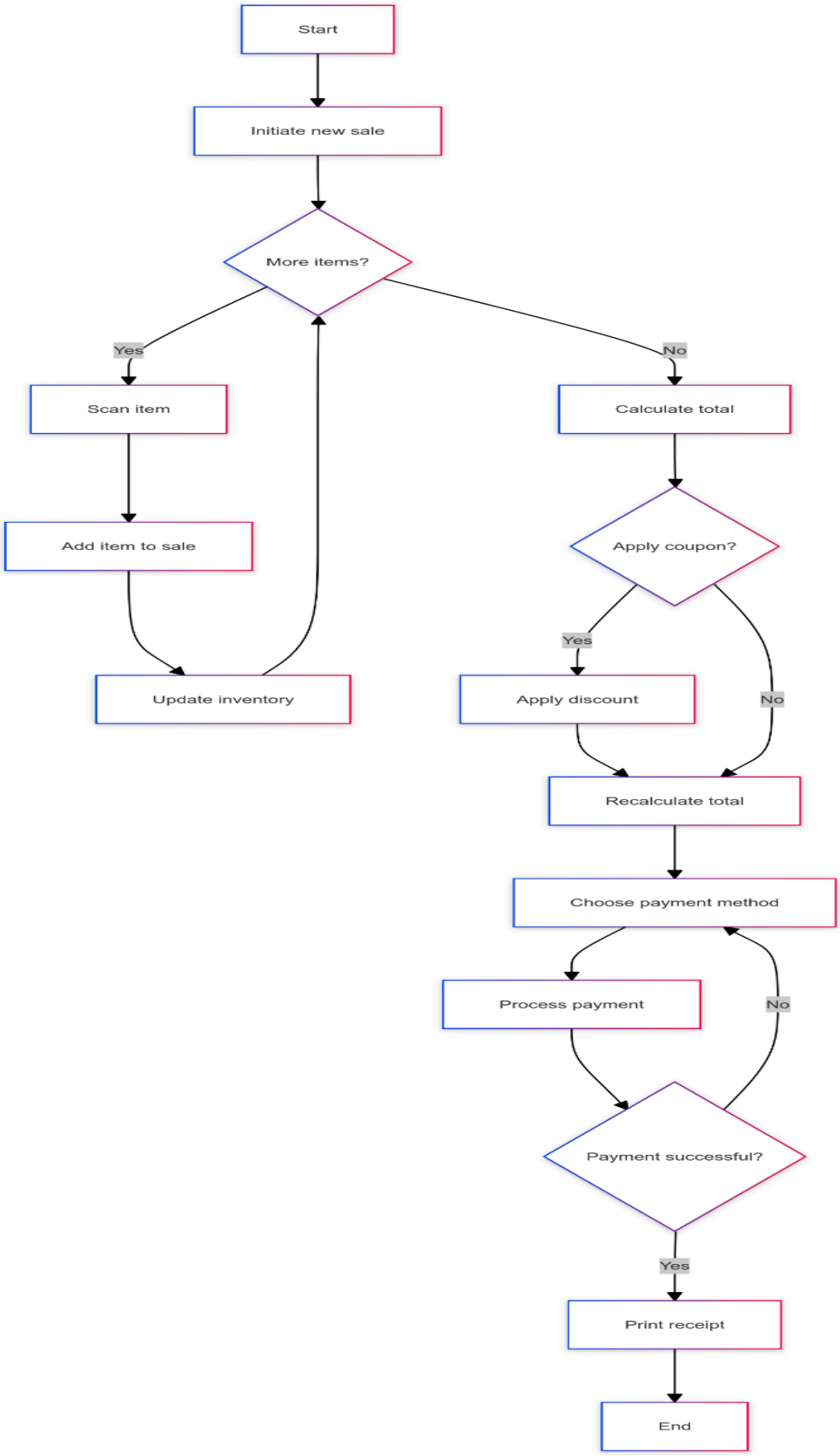


Q.4 Develop Analysis Domain Models


Employee
-id: String
-name: String
-role: Role
Return
-originalSale: Sale
-returnedItems: List
-refundAmount: Decimal
+processReturn()
Sale
-dateTime: DateTime
-items: List
-total: Decimal
+addItem(item: Item, quantity: int)
+removeItem(item: Item)
+applyDiscount(coupon: Coupon)
+calculateTotal()
SaleLineItem
-item: Item
-quantity: int
-subtotal: Decimal
Payment
-amount: Decimal
-method: PaymentMethod
+process()
Coupon
-code: String
-discountAmount: Decimal
+apply(sale: Sale)
Item
-barcode: String
-name: String
-price: Decimal
1
*
1
1
1
*
1
1
*
*
*
1

Q.5 Develop activity diagram for "Process Sale" and "Handle Return" use cases




Start
Initiate new sale
More items?
Yes
No
Scan item
Add item to sale
Update inventory
Calculate total
Apply coupon?
Yes
No
Apply discount
Recalculate total
Choose payment method
Process payment
No
Payment successful?
Yes
Print receipt
End