

Exercise 1: Use Case Diagram

1. Necessary Elements for the Online Event Ticketing System

Actors:

- **Customer:** Browses events, purchases tickets, and checks in at events.
- **Event Organizer:** Creates and manages events, provides event details.
- **System Administrator:** Manages the system's backend operations.
- **Payment Gateway:** Processes payments securely.
- **Check-in Staff:** Scans QR codes at the venue for validation.

Classes:

1. **Event:**
 - Attributes: Event ID, Name, Description, Date, Time, Venue, Ticket Price, Available Seats.
 - Methods: CreateEvent(), UpdateEvent(), ViewDetails().
2. **Customer:**
 - Attributes: Customer ID, Name, Email, Phone Number.
 - Methods: Register(), Login(), BrowseEvents(), PurchaseTicket(), ViewTickets().
3. **Ticket:**
 - Attributes: Ticket ID, Event ID, Customer ID, QR Code, Status (valid/invalid).
 - Methods: GenerateQRCode(), ValidateTicket().
4. **Payment:**
 - Attributes: Payment ID, Amount, Payment Status, Transaction Details.
 - Methods: ProcessPayment(), RefundPayment().
5. **CheckIn:**
 - Attributes: CheckIn ID, Event ID, Ticket ID, Timestamp.
 - Methods: ScanQRCode(), ValidateEntry().
6. **System:**
 - Attributes: System ID, Name, Version.
 - Methods: SendEmail(), GenerateReports().

States:

- **Customer States:**
 - Browsing Events
 - Purchasing Tickets
 - Viewing Tickets
 - Checking In
- **Ticket States:**
 - Not Purchased
 - Purchased
 - Canceled
 - Checked In

Activities:

1. **Browse Events:**
 - Customer searches for events by date, location, or category.
 - Event details are displayed.
2. **Purchase Tickets:**
 - Customer selects an event and ticket type.
 - Makes a payment through the gateway.
 - Receives an electronic ticket with a QR code.
3. **Check-in at Event:**
 - Customer presents QR code.
 - Check-in staff scans QR code for validation.
4. **Create and Manage Events:**
 - Event organizers add, edit, or delete event details.
5. **Process Payment:**
 - Secure payment through the gateway.
 - Refunds if cancellation occurs.

System Activities:

- **Generate QR Code:** System generates QR codes for tickets.
- **Send Notifications:** System sends email confirmations and reminders.
- **Validate Tickets:** System verifies ticket authenticity during check-in.

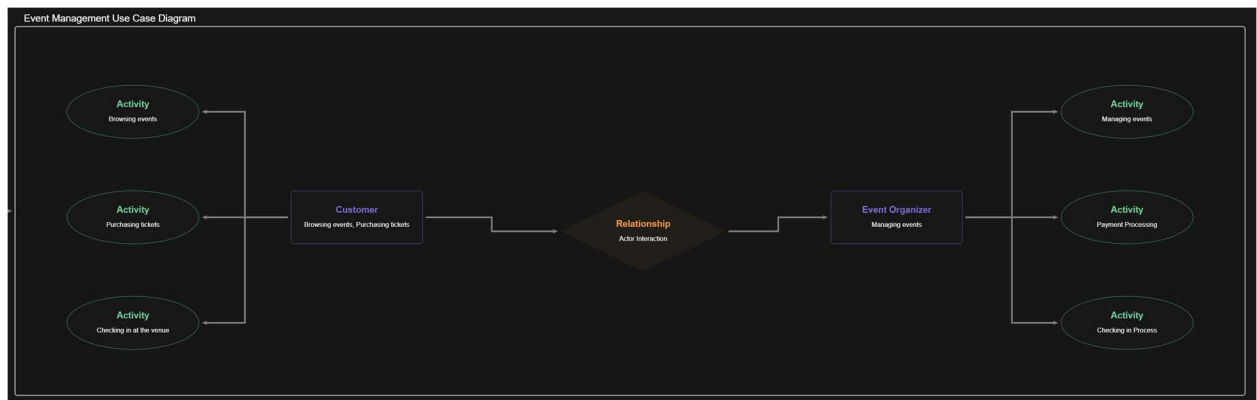


Figure 1 Use Case Diagram

Exercise 2: Class Diagram

- **Main Classes:**
 - **Event:** EventID, Name, Description, Date, Time, Venue, TicketPrice, AvailableSeats.
 - **Customer:** CustomerID, Name, Email, PhoneNumber.
 - **Ticket:** TicketID, EventID, CustomerID, QRCode, Status.
 - **Payment:** PaymentID, Amount, PaymentStatus, TransactionDetails.

- **QRCodeGenerator:** QRCodeData, GenerateQRCode().
- **System:** Name, Version, SendNotifications().
- **Relationships:**
 - **Customer** associates with **Ticket** (1-to-many).
 - **Event** aggregates **Ticket** (1-to-many).
 - **Ticket** uses **QRCodeGenerator**.
 - **Payment** is associated with **Customer** and **Ticket**.



Figure 2 Class Diagram

Exercise 3: Sequence Diagram

- **Selected Use Case:** “Purchase Ticket.”
- **Participating Objects:**
 - Customer
 - Event
 - Ticket
 - PaymentService
 - QRCodeGenerator
 - System
- **Interactions:**
 - Customer browses events.
 - Customer selects an event and initiates ticket purchase.
 - System interacts with PaymentService to process the payment.
 - System generates a QR Code via QRCodeGenerator.
 - Ticket is created and linked to the customer and event.

- Confirmation is sent to the customer.

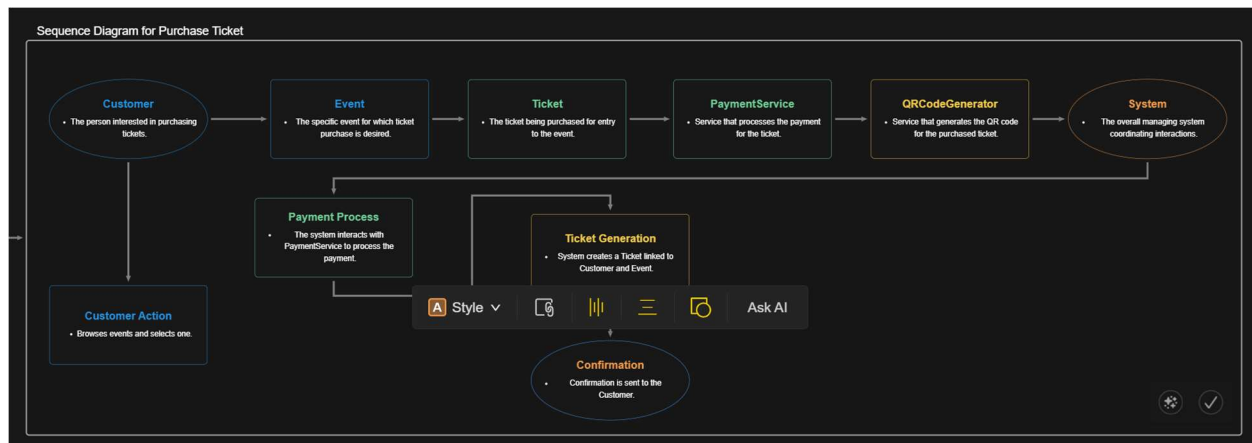


Figure 3 Sequence Diagram

Exercise 4: State Machine Diagram

1. **Entity:** Ticket.
2. **States:**
 - Available
 - Reserved
 - Purchased
 - CheckedIn
 - Invalid
3. **Transitions:**
 - Reserved -> Purchased (on payment confirmation).
 - Purchased -> CheckedIn (on QR Code scan at the venue).
 - Any state -> Invalid (on cancellation or failure).

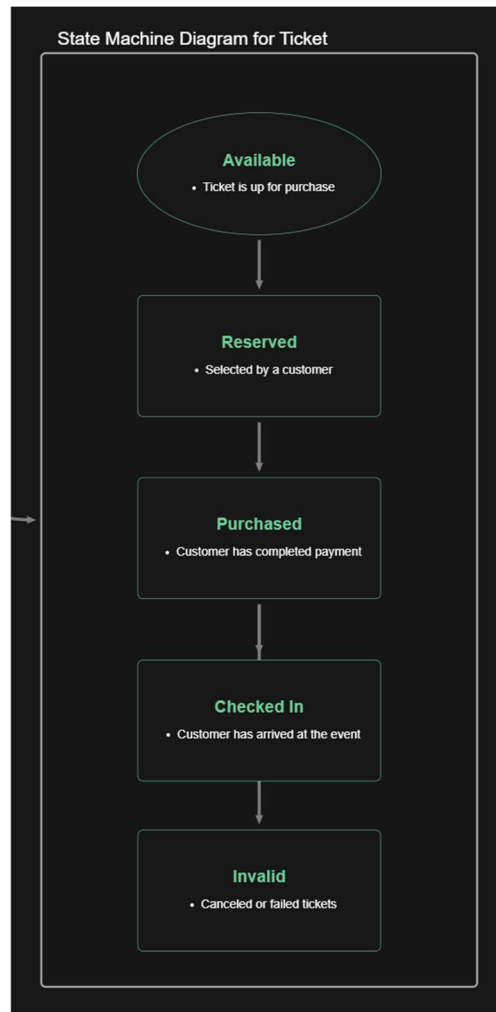


Figure 4 State Machine Diagram

Exercise 5: Activity Diagram

1. **Process:** Ticket purchasing and event check-in.
2. **Activities:**
 - Customer selects an event.
 - System processes the payment.
 - System generates a QR Code for the ticket.
 - QR Code is sent to the customer.
 - Customer presents QR Code at the venue.
 - System validates the QR Code.
 - Customer is checked in.

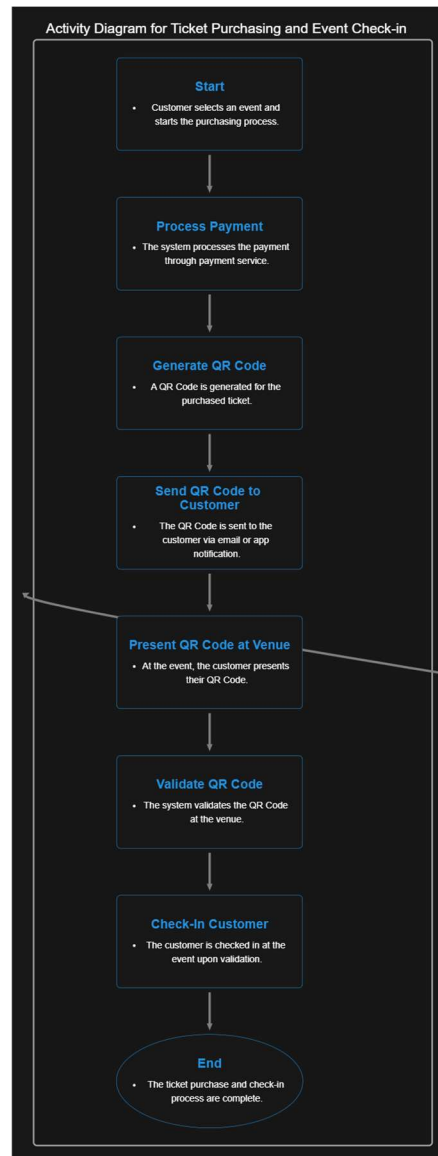


Figure 5 Activity Diagram