Online Event Ticket Reservation System - Project Report

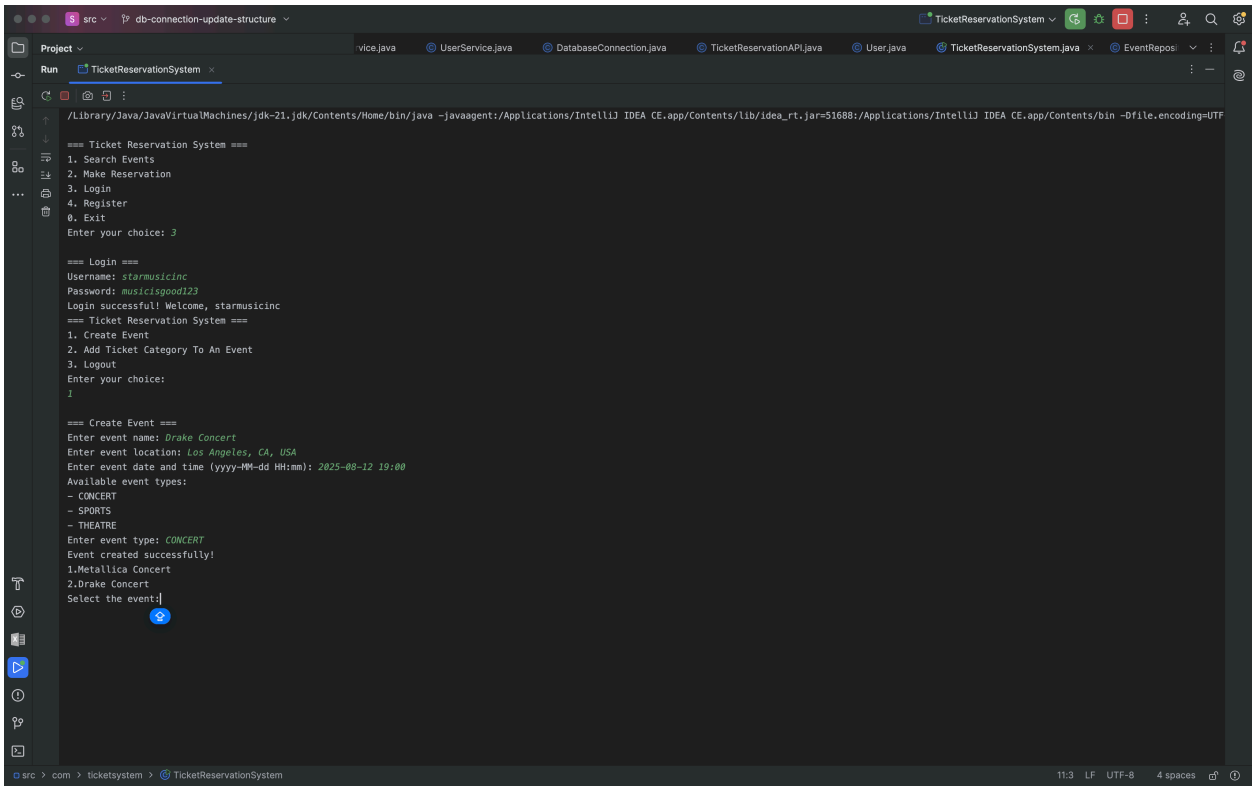
Team Contributions Table

Team Member	Contribution
Barış Yenigül	Implemented Firm Operations including event creation, ticket category management, and event type handling
Ahmet Can Karataş	Implemented User Operations including ticket search, reservation system, and user account management
Erhan Alasar	Implemented Data Persistence using PostgreSQL database with repository pattern

Usage Scenarios

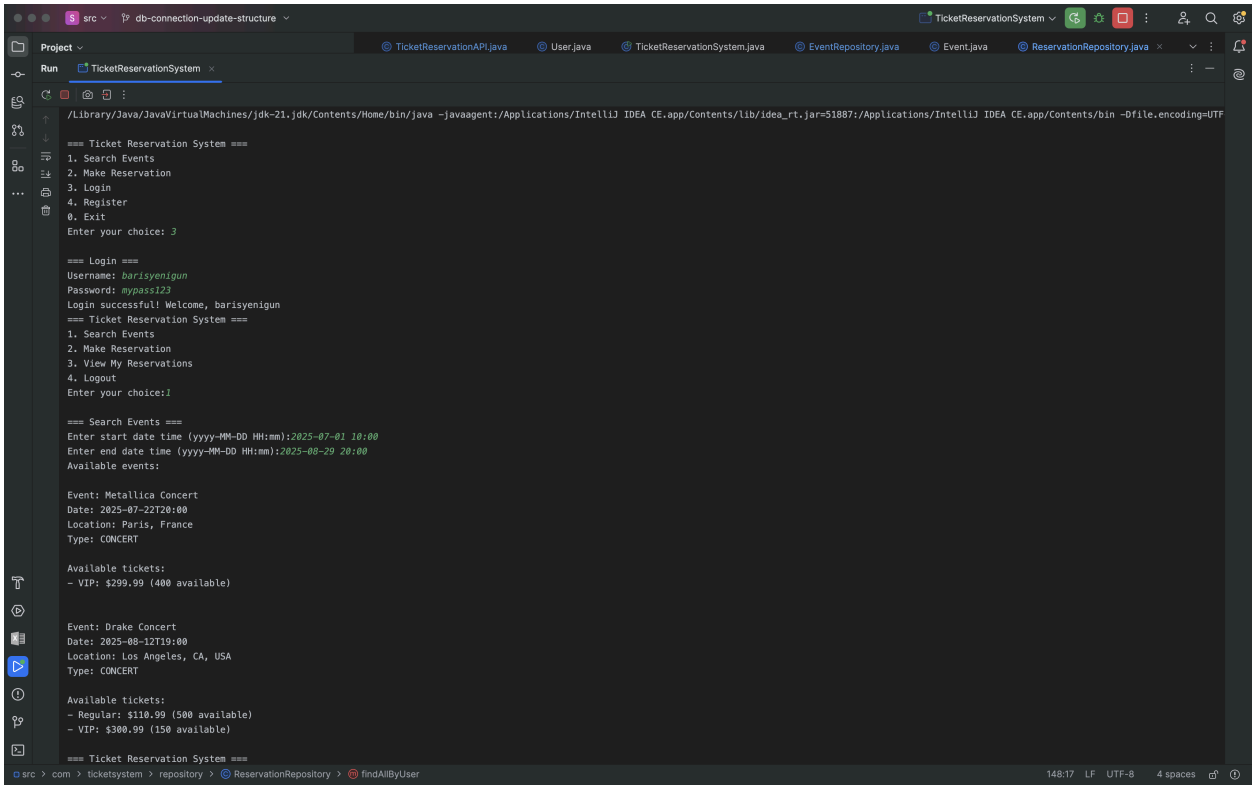
Scenario 1: Creating a New Event

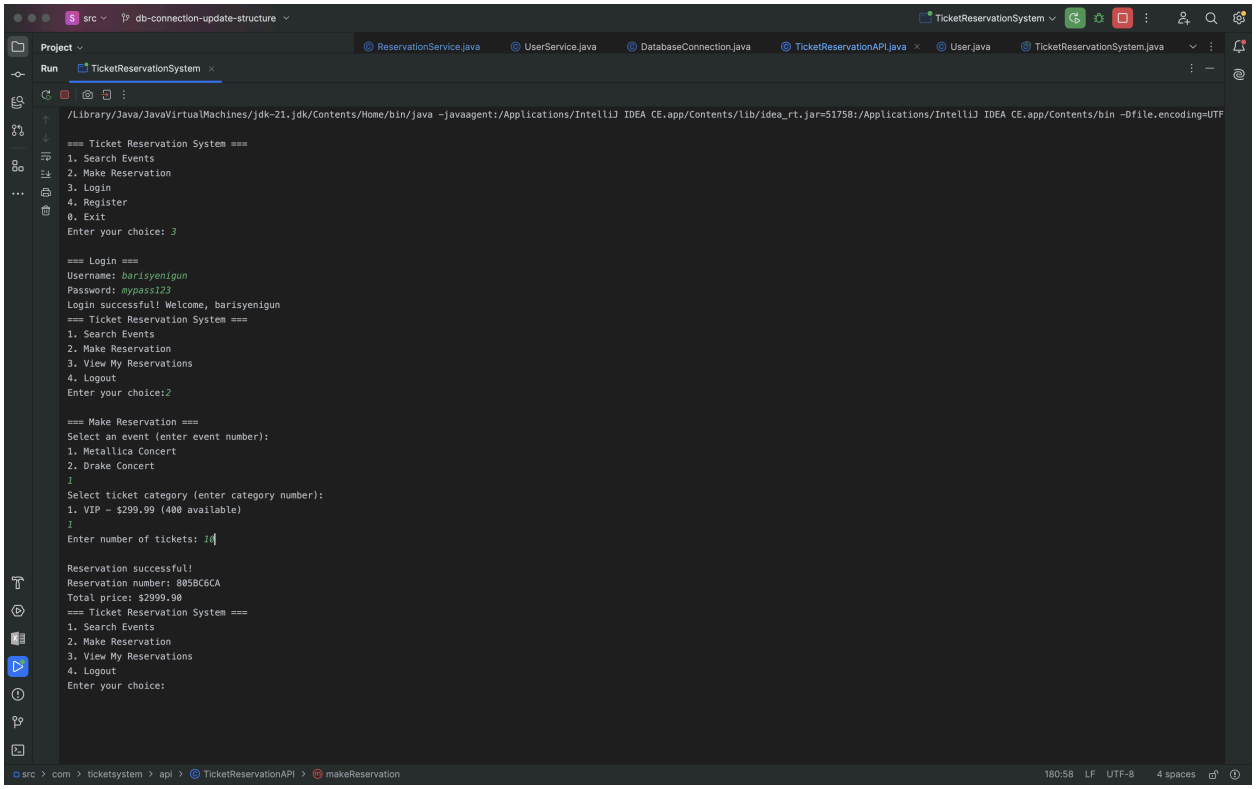
1. A firm representative logs into the system
2. Navigates to the event creation section
3. Enters event details:
   - Event name: "Drake Concert"
   - Date: August 12, 2025
   - Location: "Los Angeles CA, USA"
   - Type: Concert
4. Creates ticket categories:
   - VIP: $300.99 (150 tickets)
   - Regular: $100.99 (500 tickets)
5. System confirms event creation and displays event ID



Scenario 2: Searching and Reserving Tickets

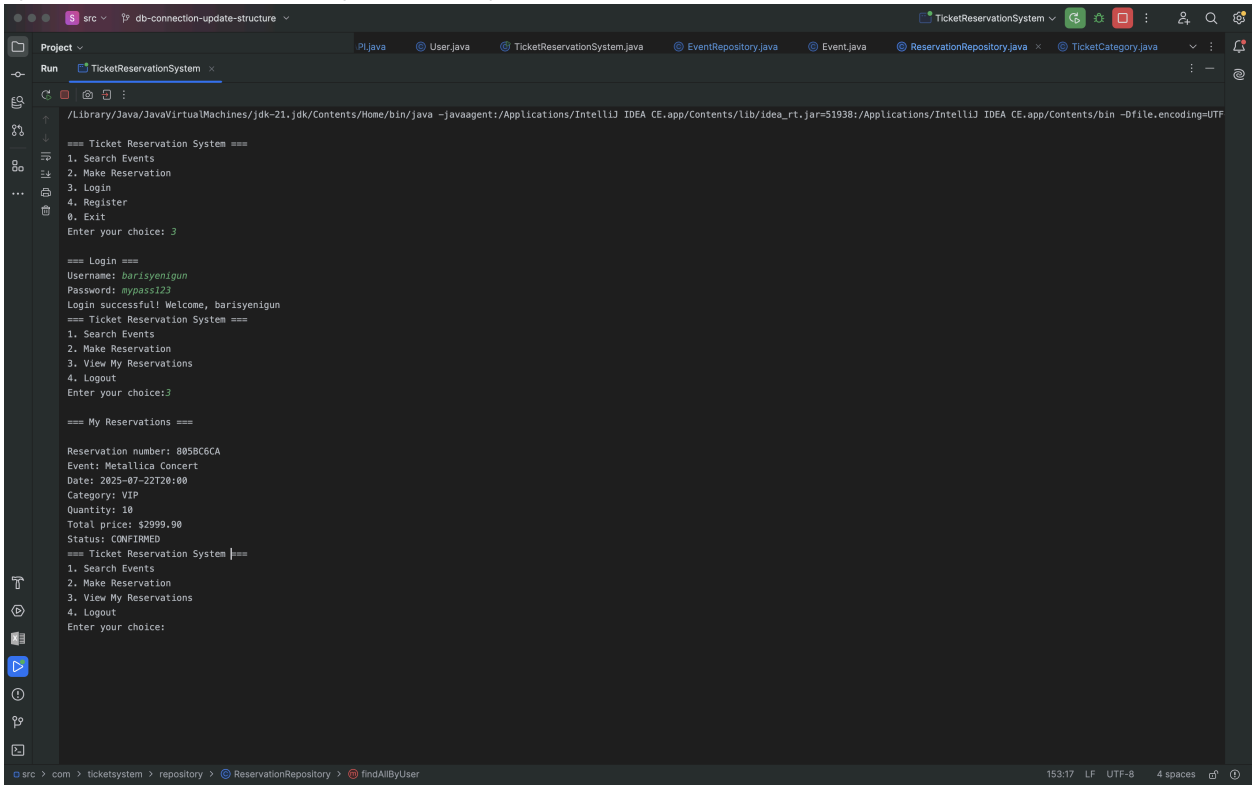
1. User searches for events between July 7- August 29, 2025
2. System displays available events with details
3. User selects "Drake Concert"
4. Views available ticket categories and prices
5. Selects 10 Regular tickets
6. System generates a unique reservation number
7. User receives confirmation with reservation details



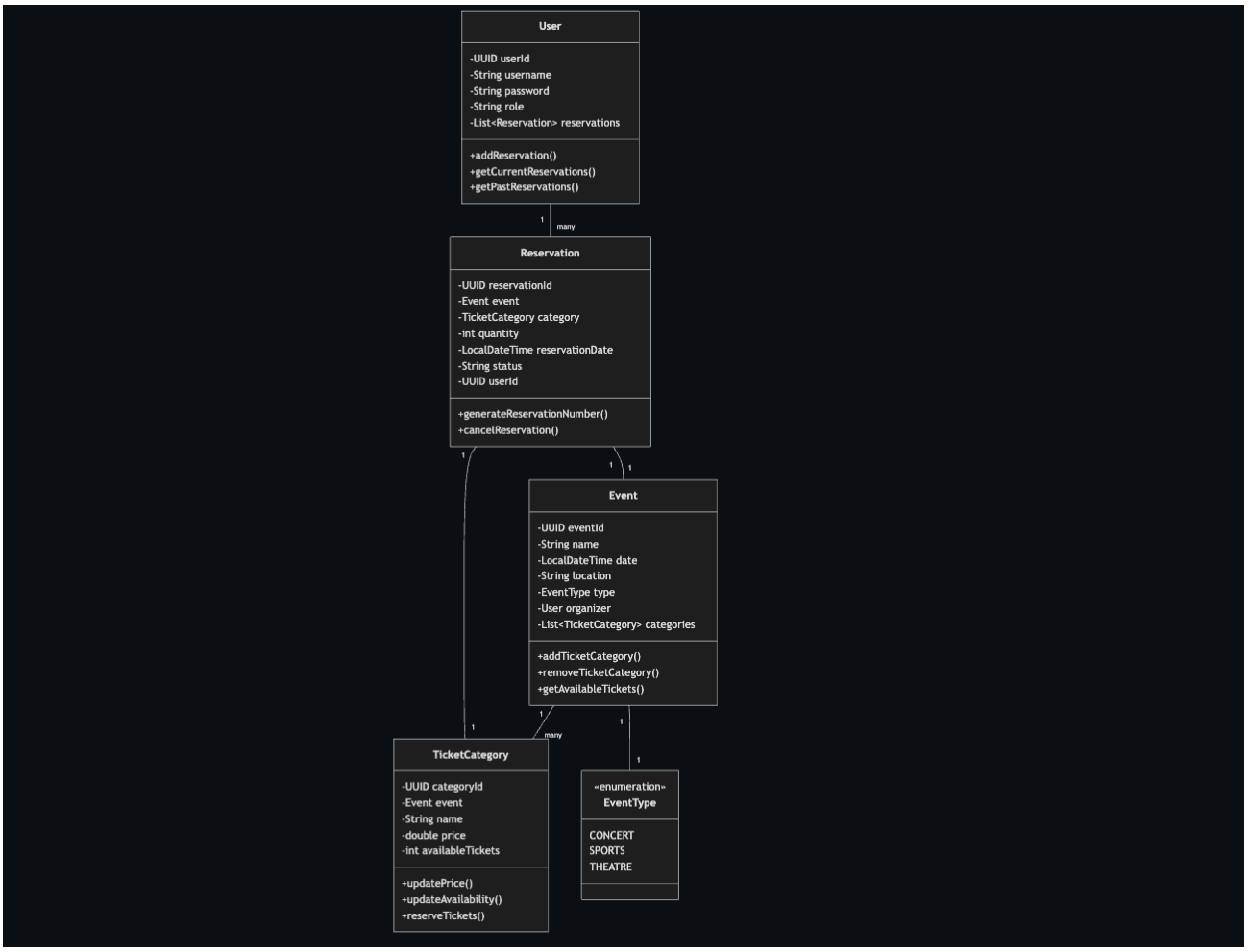


Scenario 3: Managing User Reservations

1. User logs into their account
2. Views current and past reservations
3. System updates ticket availability automatically



UML Class Diagram



Explanation of Inheritance

The system implements inheritance through the repository pattern:

1. `IRepository<T, ID>` Interface
    - Base interface defining common CRUD operations
    - Generic type parameters for entity type and ID type
    - Implemented by all specific repositories
2. Specialized Repository Interfaces
    - `IEventRepository`: Extends `IRepository` with event-specific queries
    - `IUserRepository`: Extends `IRepository` with user-specific queries
    - `IReservationRepository`: Extends `IRepository` with reservation-specific queries
    - `ITicketCategoryRepository`: Extends `IRepository` with ticket category-specific queries

Example of a specialized repository interface:

```
public interface IEventRepository<T, ID> extends IRepository<T, ID> {
    List<T> findEventsByTimeInterval(LocalDateTime startDate, LocalDateTime endDate);
```

```
    List<T> findEventsByOrganizer(UUID organizerId);
}
```

This inheritance hierarchy allows for:

- Code reuse across repositories
- Consistent CRUD operations
- Type-safe implementations
- Easy extension for new repository types

Explanation of Polymorphism

Polymorphism is applied in several areas:

1. Repository Pattern
    - All repositories implement the `IRepository` interface
    - Different implementations can be swapped without changing client code
    - Example: `UserRepository` implements `IUserRepository`
2. Event Types
    - `EventType` enum allows for different event categories
    - System can handle different event types uniformly
    - Easy to add new event types without changing existing code

Benefits:

- Flexible and extensible code
- Reduced coupling between components
- Easy maintenance and updates

Explanation of Data Persistence

The system uses PostgreSQL database for data persistence with the following implementation:

1. Database Structure
    - Tables: users, events, ticket_categories, reservations
    - Relationships maintained through foreign keys
2. Repository Pattern Implementation
    - Each entity has its own repository class
    - Repositories handle all database operations
3. Data Operations
    - CRUD operations for all entities

Example of transaction management:

```
public void save(Reservation obj) {
    String sql = "INSERT INTO reservations (reservation_id, event_id, category_id, quantity, reservation_date, s
```

```
    try {
        connection.setAutoCommit(false);  // Start transaction
        try (PreparedStatement stmt = connection.prepareStatement(sql)) {
            // Set parameters and execute
            stmt.executeUpdate();
            connection.commit();  // Commit transaction
        }
    } catch (SQLException e) {
        try {
            connection.rollback();  // Rollback on error
        } catch (SQLException ex) {
            ex.printStackTrace();
        }
    }
}
```