Railway reservation

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Here's a concise way to remember the core system:

1. **Train Class** - The inventory manager
- Contains: Train details (number, name, stations) + seat inventory + waitlist
- Think of it as: "A train knows its route and how many seats it has free"

2. **Ticket Class** - The receipt/booking proof
- Contains: PNR + train reference + passenger list + journey details (source/destination)
- Think of it as: "A ticket is proof of booking with all journey details"

3. **RailwayReservationSystem Class** - The controller
- Contains: List of all trains + Map of PNR→Tickets
- Main operations: Search trains, book tickets, cancel tickets
- Think of it as: "The main system that connects everything"

Key Point: Think of it like a hotel booking:
- Trains are like hotels (with inventory)
- Tickets are like booking confirmations
- RailwayReservationSystem is like the booking website

That's really all you need to understand the basic structure - everything else is just implementation details!

Addition details:

Yes, that's a good way to remember the core structure! Let me break down the key points you should remember for an interview:

1. **Train Object**
- Core train details:
  - Train number, name
  - List of stations (route)
  - Total seats and available seats
  - Waitlist management
- Key point: Train manages its own capacity and waitlist
- Think of it as the "inventory manager" for seats

2. **Ticket Object**
- Booking identifier:
  - Unique PNR number (automatically generated)
- Journey details:
  - Source and destination stations
  - Travel date
  - Reference to the train
- Passenger information:
  - List of passengers on this ticket
- Status information:
  - Whether it's confirmed or waitlisted
- Key point: Ticket is like a "receipt" of the booking

3. **RailwayReservationSystem Object**
- System-wide management:
  - List of all trains (inventory)
  - Map of PNR to tickets (booking records)
- Core operations:
  - Search trains

- Search trains
  - Book tickets
  - Cancel tickets
  - Retrieve booking details
- Key point: This is the "controller" that coordinates everything

Additional important points to remember:

4. **Key Relationships**
- One train can have multiple tickets
- One ticket can have multiple passengers
- Each PNR maps to exactly one ticket
- Waitlist is managed per train per date

5. **Important Design Patterns**
- Encapsulation: Each class manages its own data
- Single Responsibility: Each class has a specific role
- Data structures used:
  - ArrayList for lists (trains, passengers)
  - HashMap for lookups (bookings by PNR)

6. **Real-world Considerations**
- PNR generation is unique and sequential
- Seat availability is date-specific
- Waitlist moves to confirmed automatically when seats are available
- Cancellations update seat availability and waitlist

7. **System Features to Highlight**
- Search functionality
- Booking management
- Waitlist handling
- Cancellation processing
- Seat inventory management

8. **Error Handling**
- Check for seat availability
- Validate station existence
- Handle booking cancellations
- Manage waitlist transitions

9. **Potential Extensions** (good to mention in interviews)
- Multiple classes of seats (AC, Sleeper)
- Fare calculation
- User authentication
- Payment processing
- Schedule management

Remember: In an interview, it's good to:
1. Start with the basic structure
2. Explain how classes interact
3. Mention error handling
4. Discuss possible extensions
5. Talk about scalability considerations

Behavioral aspects to highlight:
- The system follows object-oriented principles
- Each component has clear responsibilities
- The design is extensible
- The system handles real-world scenarios (like waitlisting)
- Error cases are considered

This understanding shows you grasp both the technical implementation and the real-world application of the system.