**Car Rental & Booking Management System**

**Phase 1: Problem Understanding & Industry Analysis**

**➢Goal:**To build a centralized system that manages cars, customers, and bookings while ensuring real-time availability, automated billing, and transparent rental operations.

**1. Requirement Gathering**

* Meet stakeholders (customers, rental agents, branch managers, administrators).
* Example requirements:
  + Register cars with details (model, number plate, availability, rental rate).
  + Allow customers to browse and book cars.
  + Prevent double-booking of the same car for overlapping dates.
  + Generate invoices automatically after booking completion.
  + Track maintenance schedules for cars.
  + Generate reports on revenue, most rented cars, and customer usage.

**2. Stakeholder Analysis**

* **Admin:** Configures system, manages all data and users.
* **Branch Manager:** Manages cars at specific branch, oversees bookings.
* **Rental Agent:** Handles customer queries, assists with bookings.
* **Customer:** Browses available cars, makes bookings, views invoices.
* **Finance Officer:** Reviews payments, revenue, and reports.

**3. Business Process Mapping**

* **Flow:**  
  Customer browses cars → Selects car & dates → System checks availability → Booking created → Payment processed → Car allocated → Customer returns car → System updates status → Invoice generated → Reports updated.

**4. Industry-Specific Use Case Analysis**

* Traditional booking via phone/paper is inefficient and error-prone.
* Online self-service booking improves customer experience.
* Real-time availability prevents conflicts in reservations.
* Automated billing and reporting ensure transparency and reduce manual work.

**Phase 2: Org Setup & Configuration**

**➢ Goal:** Prepare Salesforce org for car rental management.

1. **Salesforce Edition:** Developer Org.
2. **Company Profile:** Add rental company info, currency = INR.
3. **Business Hours & Holidays:** 24/7 rental service; holidays = none.
4. **Fiscal Year:** Jan–Dec.
5. **User Setup:** Customer, Rental Agent, Branch Manager, Admin.
6. **Profiles:**

* Customer = limited (can book/view cars).
* Rental Agent = manage bookings.
* Branch Manager = manage fleet & reports.
* Admin = full access.

1. R**oles:** Admin > Branch Manager > Rental Agent > Customer.
2. **Permission Sets:** Finance users get invoice & revenue reporting.
3. **OWD:**

 Cars = Public Read Only.

 Bookings = Private.

 Payments = Private.

10. **Sharing Rules:** Branch managers can view bookings for their branch.

11. **Login Policies:** Agents log in during branch hours only.

12. **Sandbox Usage:** Test before deployment.

13. **Deployment Basics:** Use Change Sets.

**Phase 3: Data Modeling & Relationships**

**➢ Goal**: Define data structure.

1. **Objects:**

* Car\_\_c – fields: Model, NumberPlate, Availability, DailyRate, Branch.
* Customer\_\_c – fields: Name, LicenseNo, Contact, Email.
* Booking\_\_c – fields: Customer, Car, StartDate, EndDate, Status.
* Invoice\_\_c – fields: Booking, Amount, PaymentStatus.
* Branch\_\_c – fields: Name, Location, Manager.

1. **Fields:**

* Car: Availability\_\_c (Picklist – Available, Rented, Maintenance).
* Booking: Status\_\_c (Picklist – Reserved, Ongoing, Completed, Cancelled).
* Invoice: PaymentStatus\_\_c (Picklist – Pending, Paid, Overdue).

**3. Record Types:**

* Booking: “Daily Rental”, “Weekly Rental”, “Monthly Rental”.

**4. Page Layouts:**

* Car → related bookings.
* Customer → booking history.

**5. Relationships:**

* Booking ↔ Car (Lookup).
* Booking ↔ Customer (Lookup).
* Invoice ↔ Booking (Master-Detail).
* Car ↔ Branch (Lookup).

**6. Junction Object:** Booking links Car & Customer.

**Phase 4: Process Automation (Admin)**

**➢ Goal:** Automate workflows.

1. **Validation Rule:** Prevent booking if car not available.
2. **Workflow Rule:** Send email/SMS confirmation after booking.
3. **Approval Process:** Manager approves high-value bookings.
4. **Flow Builder:**
   * Calculate total rental cost = DailyRate × Days.
   * Update Car availability when booking is created/closed.
5. **Email Alerts:** Customer gets invoice after completion.
6. **Tasks:** Create reminder for car return date.
7. **Custom Notifications:** Push app notification before return deadline.

**Phase 5: Apex Programming (Developer)**

**➢ Goal:** Custom logic for rentals.

1. **Apex Trigger:** On Booking insert → check overlapping dates.
2. **SOQL:** Query available cars within selected dates.
3. **Batch Apex:** Weekly report of overdue returns.
4. **Queueable Apex:** Send reminders for upcoming returns.
5. **Scheduled Apex:** Every morning → list available cars.
6. **Future Method:** Call external payment gateway API async.
7. **Test Classes:** Insert car, booking, and validate trigger.

**Phase 6: User Interface Development**

**➢ Goal:** Build user-friendly app.

1. **Lightning App Builder:** “Car Rental Management” app.
2. **Record Pages:** Car → list of bookings.
3. **Tabs:** Cars, Customers, Bookings, Invoices, Branches.
4. **Home Page:** Show available cars & pending bookings.
5. **Utility Bar:** Quick action → Create Booking.
6. **LWC:** Car search & booking form.
7. **Apex + LWC:** Calculate rental cost in real-time.
8. **Navigation Service:** Redirect customer to invoice after booking.

**Phase 7: Integration & External Access**

**➢ Goal:** Connect with third-party services.

1. **Named Credentials:** Store payment gateway API.
2. **External Services:** GPS tracking integration for cars.
3. **Web Services:** REST API to fetch customer license verification.
4. **Platform Events:** Event → “Car Returned”.
5. **Change Data Capture:** Notify manager if booking status changes.
6. **Salesforce Connect:** Sync with external billing system.
7. **OAuth Authentication:** Secure login for customers.

**Phase 8: Data Management & Deployment**

**➢ Goal:** Handle rental data securely.

1. Import Wizard → Import customers.
2. Data Loader → Bulk car records.
3. Duplicate Rules → Prevent duplicate license entries.
4. Data Backup → Weekly export.
5. Change Sets → Deploy flows & triggers.
6. Packages → Unmanaged for demo.

**Phase 9: Reporting, Dashboards & Security Review**

**➢ Goal:** Monitor rentals and revenue.

1. **Reports:**
   * Cars by Branch.
   * Bookings by Status.
   * Revenue by Month.
2. **Dashboards:**
   * Manager → Fleet utilization.
   * Finance Officer → Revenue trends.
3. **Dynamic Dashboards:** Branch managers see only their cars.
4. **Field-Level Security:** Hide license numbers from rental agents.
5. **Audit Trail:** Track booking cancellations.

**Phase 10: Final Presentation & Demo**

**➢ Goal:** Showcase solution.

1. **Pitch Presentation:** Problem → Solution → Benefits.
2. **Demo Walkthrough:**
   * Customer books car → System checks availability → Booking created → Payment made → Car returned → Invoice generated.
3. **Handoff Documentation:** Data model, UML diagrams, workflows.
4. **Portfolio Showcase:** Post as “Built Car Rental & Booking CRM on Salesforce.”