**Case Study: Fleet Management System**

**Problem Statement:**

Design and implement a Fleet Management System using Oracle SQL and PL/SQL. The system will be used to manage vehicles, drivers, maintenance schedules, and trip records. Your task is to create the necessary database schema, populate the database with sample data, and develop PL/SQL procedures to handle vehicle allocation, maintenance tracking, and generating trip reports.

**Requirements:**

1. **Vehicle Management**:
   * Implement the functionality to add, update, delete, and search for vehicles.
   * Ensure that each vehicle has attributes such as VEHICLE\_ID, MAKE, MODEL, YEAR, LICENSE\_PLATE, and STATUS.
2. **Driver Management**:
   * Implement the functionality to add, update, delete, and search for drivers.
   * Ensure that each driver has attributes such as DRIVER\_ID, FIRST\_NAME, LAST\_NAME, LICENSE\_NUMBER, and STATUS.
3. **Maintenance Management**:
   * Implement the functionality to schedule and track maintenance activities.
   * Ensure that each maintenance record has attributes such as MAINTENANCE\_ID, VEHICLE\_ID, MAINTENANCE\_DATE, DESCRIPTION, and STATUS.
4. **Trip Management**:
   * Implement the functionality to record and track trips made by vehicles.
   * Ensure that each trip record has attributes such as TRIP\_ID, VEHICLE\_ID, DRIVER\_ID, TRIP\_DATE, START\_LOCATION, END\_LOCATION, and DISTANCE.

**Tasks:**

1. **Design the Database Schema**:
   * Create the Vehicles, Drivers, Maintenance, and Trips tables with the appropriate fields and constraints.
   * Define primary keys and foreign keys to maintain data integrity.
2. **Populate the Database with Sample Data**:
   * Insert sample records into the Vehicles, Drivers, Maintenance, and Trips tables to facilitate testing of the system.
3. **Develop PL/SQL Procedures**:
   * Create a procedure to handle vehicle allocation. The procedure should assign a vehicle to a driver for a trip.
   * Create a procedure to handle maintenance tracking. The procedure should update the maintenance record and vehicle status.
   * Create a procedure to generate trip reports, including details such as trip information, vehicle details, driver details, and trip distance.

**Expected Outcomes:**

1. **Vehicles Table**:
   * Contains all information about the vehicles in the system.
2. **Drivers Table**:
   * Contains details of all drivers in the fleet.
3. **Maintenance Table**:
   * Tracks maintenance activities for each vehicle.
4. **Trips Table**:
   * Tracks trip details, including trip dates and distances.
5. **PL/SQL Procedures**:
   * Efficiently manage vehicle allocation, maintenance tracking, and generating trip reports, maintaining accurate records in the database.

**Deliverables:**

1. SQL scripts to create the Vehicles, Drivers, Maintenance, and Trips tables.
2. SQL scripts to insert sample data into the tables.
3. PL/SQL scripts for the procedures to handle vehicle allocation, maintenance tracking, and generate trip reports.
4. Documentation explaining how to set up and use the system, including how to run the PL/SQL procedures.

**Database Schema:**

1. **Vehicles Table**:
   * **VEHICLE\_ID**: Number, Primary Key
   * **MAKE**: Varchar2(50)
   * **MODEL**: Varchar2(50)
   * **YEAR**: Number
   * **LICENSE\_PLATE**: Varchar2(20)
   * **STATUS**: Varchar2(20)
2. **Drivers Table**:
   * **DRIVER\_ID**: Number, Primary Key
   * **FIRST\_NAME**: Varchar2(50)
   * **LAST\_NAME**: Varchar2(50)
   * **LICENSE\_NUMBER**: Varchar2(20)
   * **STATUS**: Varchar2(20)
3. **Maintenance Table**:
   * **MAINTENANCE\_ID**: Number, Primary Key
   * **VEHICLE\_ID**: Number, Foreign Key References Vehicles(VEHICLE\_ID)
   * **MAINTENANCE\_DATE**: Date
   * **DESCRIPTION**: Varchar2(255)
   * **STATUS**: Varchar2(20)
4. **Trips Table**:
   * **TRIP\_ID**: Number, Primary Key
   * **VEHICLE\_ID**: Number, Foreign Key References Vehicles(VEHICLE\_ID)
   * **DRIVER\_ID**: Number, Foreign Key References Drivers(DRIVER\_ID)
   * **TRIP\_DATE**: Date
   * **START\_LOCATION**: Varchar2(100)
   * **END\_LOCATION**: Varchar2(100)
   * **DISTANCE**: Number

**Case Study Task:**

* **Design**: Create the database schema as provided.
* **Implement**: Insert sample data into the tables.
* **Develop**: Write PL/SQL procedures for handling vehicle allocation, maintenance tracking, and generating trip reports.
* **Test**: Test the procedures with various scenarios (e.g., allocating a vehicle, scheduling maintenance, generating reports, ensuring proper updates).