Algorithm for Car Dealership Management System

1. System Initialization

1. **Start.**
2. Load car inventory from the file.
3. Load customer data from the file.
4. Display the **Main Menu**.

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2. Main Menu

1. Display options:
    - **1**: Manage Car Inventory.
    - **2**: Process Sales.
    - **3**: Manage Customers.
    - **4**: Generate Reports.
    - **5**: Search.
    - **6**: Compare Cars.
    - **7**: Exit.
2. Accept user input.
3. Based on the input, call the respective module.

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3. Manage Car Inventory

1. Display options:
    - **1**: Add Car.
    - **2**: Update Car.
    - **3**: Remove Car.
    - **4**: View Cars.
    - **5**: Back to Main Menu.
2. Accept user input.
3. Perform actions based on the input:
    - **Add Car**:
        1. Accept car details (brand, model, price, type, mileage, etc.).
        2. Add the car to the inventory list.
        3. Save updated inventory to the file.
    - **Update Car**:

        1. Search for the car by ID.
        2. Accept and update the details.
        3. Save the updated inventory to the file.
    - **Remove Car**:
        1. Search for the car by ID.
        2. Remove the car from the inventory.
        3. Save the updated inventory to the file.
    - **View Cars**:
        1. Display all cars in the inventory with details.

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4. Process Sales

1. Display all available cars.
2. Accept customer details (name, contact number, etc.).
3. Accept the ID of the car the customer wants to purchase.
4. Perform sale validation:
    - Check if the car is available.
    - If not, display a message and return to the menu.
5. Mark the car as sold.
6. Save the sale details:
    - Update the car status in inventory.
    - Save customer and sales data to the respective files.
7. Generate and display an invoice with car and sale details.

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5. Manage Customers

1. Display options:
    - **1**: Add Customer.
    - **2**: View Customers.
    - **3**: View Purchase History.
    - **4**: Back to Main Menu.
2. Accept user input.
3. Perform actions based on the input:
    - **Add Customer**:
        1. Accept customer details (name, contact, etc.).
        2. Add the customer to the customer list.
        3. Save the updated customer list to the file.
    - **View Customers**:
        1. Display all customers with their details.
    - **View Purchase History**:

1. Accept customer ID or name.
2. Retrieve and display all past purchases of the customer.

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6. Generate Reports

1. Display options:
    - **1**: Sales Report.
    - **2**: Inventory Report.
    - **3**: Back to Main Menu.
2. Accept user input.
3. Perform actions based on the input:
    - **Sales Report**:
        1. Calculate total revenue from sales.
        2. Display a list of sold cars with details.
    - **Inventory Report**:
        1. Display all available cars with their details.

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7. Search

1. Display options:
    - **1**: Search Cars.
    - **2**: Search Customers.
    - **3**: Back to Main Menu.
2. Accept user input.
3. Perform actions based on the input:
    - **Search Cars**:
        1. Accept search criteria (e.g., brand, model, price range).
        2. Search and display matching cars.
    - **Search Customers**:
        1. Accept search criteria (e.g., name, contact number).
        2. Search and display matching customers.

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8. Compare Cars

1. Display all available cars.
2. Accept the IDs of two or more cars to compare.
3. Retrieve the details of the selected cars:
    - Attributes such as brand, model, price, mileage, warranty, etc.

4. Display the details side-by-side for comparison.
5. Highlight key differences (e.g., price, mileage).
6. Provide an option to compare other cars or return to the main menu.

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9. Exit

1. Save all changes to files:
    - Car inventory.
    - Customer data.
    - Sales records.
2. Exit the program.

End of Algorithm