Day 4 - Dynamic Frontend Components - Car Rental Marketplace

Objective:

On Day 4, the goal was to create dynamic frontend components for the Car Marketplace, including a Home Page, Car Listing Page, Car Detail Page, Payment Page, and Dashboard. These components were built to render data dynamically fetched from APIs, with a focus on modularity, reusability, and responsiveness.

Key Learning Outcomes:

1. **Dynamic Component Design**: Developed components for the homepage, car listing, car details, payment, and admin dashboard that display dynamic data.
2. **State Management**: Implemented state management techniques to handle dynamic data and user interactions.
3. **Responsive Design**: Designed all components to be responsive, ensuring a consistent experience across devices.
4. **Real-World Workflow**: Followed best practices and workflows used in real-world projects to create scalable frontend components.

Key Components Built:

1. Home Page:

- **Features**: Displayed a hero section, featured cars, and basic navigation for users to explore different car listings.
- **Data**: Dynamically fetched featured car data.
- **Screenshot**: Available in Images folder -> HomePage folder -> “HomePageImage.pdf”.
- **Code Image**: Available in Images folder -> HomePage folder -> “HomePageCode.pdf”.

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2. Car Listing Page:

- **Features**: Displayed a grid of cars with their names, prices, and images. Included category filters.
- **State Management**: Handled filtering and sorting through state hooks.
- **Screenshot**: Available in Images folder -> CarListing folder -> "CarListingImage.pdf".
- **Code Image**: Available in Images folder -> CarListing folder -> "CarListingCode.pdf".

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3. Car Detail Page:

- **Features**: Showed detailed information about a selected car, including images, specifications, price, and available options.
- **Dynamic Routing**: Used Next.js dynamic routing to render car details based on the car ID in the URL.
- **Screenshot**: Available in Images folder -> CarDetail folder -> "CarDetailImage.pdf".
- **Code Image**: Available in Images folder -> CarDetail folder -> "CarDetailCode.pdf".

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4. Payment Page:

- **Features**: Implemented a simple payment page with a mock form for payment details, including a credit card input, billing address, and total amount.
- **State Management**: Managed form data using React state and handled form submission.
- **Screenshot**: Available in Images folder -> CarPayment folder -> "CarPaymentImage.pdf".
- **Code Image**: Available in Images folder -> CarPayment folder -> "CarPaymentCode.pdf".

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5. Dashboard (Admin Panel):

- **Features**: Allowed administrators to view and manage cars, view orders, and generate reports.
- **State Management**: Managed dashboard data (cars, orders, etc.) using React state and context.
- **Screenshot**: Available in Images folder -> CarDashboard folder -> "CarDashboardImage.pdf".
- **Code Image**: Available in Images folder -> CarDashboard folder -> "CarDashboardCode.pdf".

Documentation:

Steps Taken:

1. **Setup**:
    - Connected the Next.js app with a car API to dynamically fetch car data.
    - Integrated dynamic routing using Next.js for car detail pages.
2. **Component Development**:
    - Built key components for the car marketplace: HomePage, CarListingPage, CarDetailPage, PaymentPage and Dashboard.
    - Ensured components were reusable and modular for future scalability.
3. **Routing and State Management**:
    - Used Next.js dynamic routing to load individual car details.
    - Managed state for the category filters and form inputs using React hooks.
4. **Styling and Responsiveness**:
    - Applied Tailwind CSS for responsive layouts, ensuring mobile-first designs.
    - Used utility classes for grid layouts, buttons, and form elements.

Challenges Faced & Solutions:

- **Challenge 1: Dynamic Routing for Car Details**

    - **Solution**: Used Next.js dynamic routing to fetch and display individual car data based on the ID from the URL.

- **Challenge 2: Payment Form Integration**
    - **Solution**: Built a simple mock payment form using React state to capture payment data, ready to integrate with real payment gateways in the future.
- **Challenge 3: Admin Dashboard Data Handling**
    - **Solution**: Managed multiple data sets (cars, orders) using React state and context to provide a dynamic admin interface.

Best Practices Followed:

1. **Reusable Components**:
    - Built reusable components like for easy maintenance and scalability.
2. **State Management**:
    - Used React Context for global state management where required and useState for local component-level state.
3. **Performance Optimization**:
    - Implemented lazy loading for images to improve page load times, especially on the car listing page.
4. **Responsive Design**:
    - Used Tailwind CSS to ensure a mobile-first responsive design.

Repository Submission:

- **GitHub Repository**: Link to Repository
- **Folder Structure**:

Document.pdf

/Day-4

/BUILDING DYNAMIC FRONTEND COMPONENTS FOR YOUR MARKETPLACE

/Images

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/CarPaymentCode.pdf

/Car Dashboard

/CarDashboardImage.pdf

/CarDashboardCode.pdf

Conclusion:

By the end of Day 4, I successfully created dynamic frontend components for a Car Marketplace. This included a Home Page, Car Listing Page, Car Detail Page, Payment Page, and Admin Dashboard. All components were developed with a focus on modularity, reusability, and responsiveness. The project is ready for further integration and deployment.