**Brief Project Understanding**

Understanding this project involves grasping the core   
**objectives, functionalities, and technical requirements** necessary to build a high performance

**Analysis app for car racing on iOS**

**1. Core Objective**

The primary goal of the project is to develop a high **performance iOS app specifically designed for car racing enthusiasts and professionals**. The app will use high precision GPS data to provide detailed performance analysis, real time data monitoring, and comparisons across different racing sessions and laps.

**2. Key Functionalities**

**1.1 Comprehensive Analysis**

* **Session Recap:** Provide a **detailed overview of the entire racing session**, including metrics such as speed, acceleration, and lap times.
* **Lap Recap:** Offer a **detailed breakdown of each lap's performance**.
* **Corner by Corner Analysis:** Analyze **each corner of the track**, focusing on deceleration, minimum speed, and acceleration to optimize cornering techniques.
* **Performance Comparison:** Compare **data from different laps** to identify improvements or areas needing adjustment.
* **Optimal Lap:** Determine **the theoretically fastest lap** possible based on recorded data.

**1.2 Racing Lines Analysis**

**Trajectory Analysis:** Analyze racing lines by evaluating the **radius of curvature and distance between point to point trajectories** to help refine driving strategies.

**1.3 Real Time Data Display**

**Live Metrics:** Display key performance metrics in real time during a race or practice session, ensuring minimal delay for effective decision making.

**1.4 Data Export**

**Export Options:** Allow users to export their **performance data in formats such as CSV or Excel** for further analysis or sharing.

**1.5 NTRIP Client Integration**

**High Precision GPS:** Integrate NTRIP client functionality to choose between different services for enhanced GPS accuracy.

**1.6 GPS Data Reception**

**Bluetooth Connectivity:** Support the reception **of GPS data via Bluetooth from external devices**.

**1.7 User Management**

**Login System:** Implement **user profiles** and **authentication to manage personal data** and settings.

**1.8 Interface and User Experience:**

**Dashboard Design:** Create a clear, **intuitive dashboard** where users can easily **view tracking status, signal quality, and performance metrics.**

**Customizable Layouts:** Allow users to **customize the layout of their dashboard** and menus to fit their preferences.

**Menu Structure:** Organize features into a logical, multilevel menu system for ease of navigation.

**Connection Management:** Provide a section for managing connection types, including NTRIP services and GPS devices.

**3. Technical Requirements**

**3.1 Platform**

* The app will be developed for iOS using Swift, leveraging Apple's development tools and frameworks.

**3.2 GPS and Bluetooth Integration**

* **GPS Data Handling:** Use Core Location or other suitable libraries to handle high precision GPS data.
* **Bluetooth Integration:** Implement Core Bluetooth to manage communication with Bluetooth GPS devices.

**3.3 Data Processing**

* Performance Algorithms: Develop algorithms for analyzing speed, acceleration, lap times, and optimal racing lines.
* Real Time Processing: Ensure the app can process and display data in real time with minimal latency.

**3.4 NTRIP Integration:**

* **Service Selection:** Provide functionality for users to select different NTRIP services for enhanced GPS accuracy.

**3.5 User Interface (UI) and User Experience (UX):**

* **Design and Usability:** Focus on a high quality, user friendly design that allows easy access to all features and data.
* **Customization:** Enable users to adjust layouts and menus to match their individual needs and preferences.

**3.6 Data Export:**

* **File Formats:** Implement export features for commonly used file formats like CSV and Excel.

**4. Project Deliverables**

**4.1 Design Assets:**

* Wireframes and highfidelity mockups.
* Interactive prototypes.

**4.2 Development:**

* Functional iOS app with all core features implemented.
* Backend services if required for user management and data storage.

**4.3 Documentation:**

* User guides and inapp tutorials.
* Technical documentation for future maintenance.

**4.4 Testing:**

* Thorough testing reports including unit, integration, and user acceptance testing.

**4.5 Deployment:**

* App Store submission and launch strategy.
* Postlaunch support and updates.

**5. Timeline and Budget**

5.1 Timeline:

* **Discovery & Planning: 1 weeks**
* **Design: 1 weeks**
* **Development: 4 weeks max**
* **Testing: 4 days max**
* **Deployment & Review: 2, 3 days**