**Web Application for Assessment Scanner Project**

**Objective**

The objective of the web application is to integrate the scanned marks and student details from a mobile app, store the data in real time on the web application, and provide cloud-based access to Excel files generated from the stored data.

**Tools and Technologies**

* **Frontend**: JavaScript (React)
* **Backend/Database**: Firebase (Firestore for real-time data syncing, Firebase Authentication for user management, Firebase Storage for cloud file storage)
* **Excel Generation**: SheetJS for generating and downloading Excel files
* **Cloud Storage**: Firebase Cloud Storage for uploading and syncing files

**Steps to Implement the Web Application**

**1. User Registration/Login**

* **Firebase Authentication** is used to handle user registration and login.
* Users will need to sign up or log in with their email and password.
* After authentication, users can proceed to the main dashboard of the web application where they can upload scanned data.

**2. Select Class and Create Section**

* Once logged in, the user can select the class and create a section for storing marks.
* This action will trigger the creation of a new table in the Firestore database to store the marks and student details for that particular class and section.

**3. Scan Marks & USN with OCR**

* The **mobile application** (integrated with the web application) will scan the marks and USN using **OCR** (Optical Character Recognition) technology.
* The scanned data will include the student's **marks**, **USN**, and other related details.

**4. Store Data in Firestore**

* Once the data is scanned and extracted, it will be **uploaded to Firestore**, a real-time database in Firebase.
* Each new record (marks, USN) is saved under the appropriate class and section.

**5. Generate Excel File**

* The data stored in Firestore can be exported to an **Excel file** using the **SheetJS** library.
* This Excel file will contain the marks of all students in the section and can be downloaded by the user.

**6. Automatic Upload to Cloud**

* After generating the Excel file, it will be **automatically uploaded to Firebase Cloud Storage**.
* This ensures that the file is securely stored and accessible via the cloud.

**7. Cloud Syncing**

* To enable users to access their Excel files from their PCs, the **cloud client** is installed on the user's PC.
* The **React Native FS** and SDKs are used for syncing files between the cloud storage and the local system.
* Once synced, users can access the Excel file directly from the **synced folder** on their PC.

**8. Accessing the Excel File from the Synced Folder**

* After syncing, the user can open the synced folder on their PC, where the Excel file is automatically updated.
* This provides users with easy access to the generated Excel file whenever they need it.

**Database and Cloud Storage Setup**

1. **Firebase Authentication**: For user registration, login, and management of access permissions.
2. **Firestore Database**: To store scanned marks, USN, class, and section data.
3. **Firebase Cloud Storage**: For storing and syncing Excel files across devices (PC, cloud).

**Real-Time Syncing**

* **Firestore’s real-time capabilities** ensure that when data is uploaded from the mobile app (after OCR scanning), it is instantly available on the web application.
* Whenever the data changes (e.g., new marks are added), the web application receives updates automatically without needing to refresh the page.

**UI/UX Considerations**

* The UI of the web application will include:
  + A **login page** for user authentication.
  + A **dashboard** to select the class and section.
  + A **data upload section** for uploading scanned marks.
  + **Download and sync options** for Excel files.
  + **Notifications** for updates regarding data sync and file availability.

**Conclusion**

This web application will provide a seamless integration between the mobile app and the web platform, enabling users to store and manage assessment data, generate reports in Excel format, and sync them across devices for easy access. Firebase will ensure the scalability, real-time updates, and secure cloud storage necessary for smooth operation.