**PWA AI Lesson Scheduler Overview**

The AI Voice Lesson Scheduler helps manage one-on-one lessons by using Google Forms for student input, Google Sheets for data storage, and the Google Calendar API for scheduling, confirmations, and notifications. It now also supports missed lesson tracking, drag-and-drop adjustments, and Gmail notifications for finalized schedules.

I have transitioned from a Web App to a Progressive Web App (PWA) for a cost-effective, cross-platform solution. Unlike a traditional web app, the PWA eliminates backend and hosting costs, working seamlessly across iOS, Android, and desktop. It leverages free platforms like GitHub Pages or Netlify for deployment, ensuring easy access and smooth functionality for all users.

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**Problem Statement**

Managing one-on-one voice lessons with manual scheduling can be time-consuming. The goal is to create a lightweight, accessible scheduling system using a PWA that integrates Google Forms for student input and Google Calendar for syncing schedules. This eliminates the need for complex backends and ensures access on any device (iOS, Android, Desktop). The system must also support flexibility, including dynamic updates, cancellations, and tracking of missed lessons.

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**Key Features in the PWA Version**

* Google Forms for Student Input:
* Students submit their name, lesson category, top 3 preferred time slots, frequency, and email through a Google Form.
* Data is automatically stored in a connected Google Sheet.

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**Google Sheets as the Data Source:**

* The PWA fetches form submissions from Google Sheets using authenticated API calls.
* The sheet also logs missed lessons and stores finalized data.

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**AI-Driven Scheduling Suggestions (Simplified):**

* Rule-based logic (first-come, first-served) assigns students based on their ranked time preferences.
* No conflicts are allowed; if a time slot is already taken, the system proceeds to the next available preference.

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**Teacher Finalization and Manual Editing:**

* Teachers can view, adjust, and manually drag-and-drop lessons within the interface before finalizing.
* An interactive weekly schedule grid displays assignments by day and time.

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**Google Calendar Sync and Gmail Notifications:**

* Once finalized, the schedule is automatically synced to Google Calendar.
* Each lesson is added as a 30-minute event with reminders and student email included in the description.
* Students receive personalized email confirmations listing their scheduled lesson(s).

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**Missed Lesson Logging and Right-Click Marking:**

* Teachers can right-click a scheduled lesson to mark it as "missed."
* Missed entries are automatically logged in a dedicated “Missed Lessons” tab in the Google Sheet.

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**Manual Refresh and Reset Buttons:**

* A "Refresh" button pulls the latest form responses from the Google Sheet.
* A "Reset Schedule" button clears the visual grid and internal data, allowing the teacher to rebuild the schedule from scratch.

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**Offline Support and PWA Hosting:**

* The PWA supports offline mode via a service worker and can be installed on any device.
* Hosted for free using GitHub Pages or Netlify with no backend server.

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**New System Workflow**

Accessing the PWA:

* Teachers access the app via a shareable link hosted on GitHub Pages or Netlify.
* Students only need the Google Form link to submit preferences.

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**Submitting Lesson Preferences via Google Forms:**

* Students complete the form, including:
* Full name
* Lesson category (e.g., MSM, Curtis, Private)
* Top 3 preferred day/time slots
* Frequency (Weekly, Biweekly, Monthly, Once)
* Email address

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**Reviewing and Finalizing Schedules:**

* Teacher logs in via Google and authorizes API access.
* Form responses are loaded from Google Sheets and displayed in a table.
* A suggested schedule is generated using first-come-first-served logic.
* The teacher can drag and drop to adjust lesson placements.

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**Syncing with Google Calendar:**

* Clicking "Finalize Schedule" syncs events to the teacher’s Google Calendar.
* Each student’s schedule is also emailed to them via Gmail API.

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**Post-Lesson Tracking and Missed Lessons:**

* Right-clicking a scheduled cell allows teachers to mark the lesson as missed.
* Each missed record is appended to the Google Sheet under “Missed Lessons.”

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**Technical Components**

* Google Forms:
* Collects structured student data and pushes it to Sheets.

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**Google Sheets:**

* Primary data store for:
* Form submissions
* Missed lessons
* Scheduling logic inputs

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**PWA (Progressive Web App):**

* Responsive front-end built in HTML, CSS, and JavaScript.
* Includes drag-and-drop UI, service worker for offline use, and installable features.

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**Google Calendar API:**

* Adds finalized lessons as calendar events with reminders.
* Handles time zone logic and automatic time parsing.

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**Gmail API:**

* Sends confirmation emails to each student upon finalization.
* Each email lists all scheduled lesson times and allows for reply-based rescheduling.

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**Service Worker (for PWA):**

* Enables caching and offline support for persistent app access.
* Handles network fallback for non-Google requests.