**Overview and Goal**

The goal is to implement a 4-day online quiz competition (plus one practice day) using a combination of Google Sheets/Forms for data collection and Google App Script for automation, validation, scoring, and communication. A custom web application will host the daily quiz interface.

### Data Structure (Google Sheets)

The system uses four main sheets to manage data:

| **Sheet Name** | **Purpose** | **Key Data Fields** |
| --- | --- | --- |
| **Registration** | Stores participant details from the Google Form. | **Timestamp**, Full Name, Email ID, Phone Number, Section/Unit Name, **Registration ID (Unique 8-digit)**. |
| **Answer Key** | Stores the correct answers for each quiz day. | **DayCode** (D0, D1, D2, D3, D4), Date, **Q1 Answer... Q10 Answer** (A/B/C/D). |
| **Submission** | Stores the participant's attempts and initial results. | **Timestamp**, **Reg ID**, **DayCode**, Start Time, End Time, Q1 Answer... Q10 Answer, **Duration (Calculated)**, **Total Correct (Calculated)**. |
| **Leaderboard** | Stores the final ranked scores for display. | **Rank**, Participant Name, **Registration ID**, **Total Score**, Submission Time (Timestamp), Total Time (Duration). |

### Web Application Logic (Daily Quiz Page)

The webpage will handle **Day Code determination, Reg ID validation, and duplicate submission checks** by making API calls to the Google Sheet for data lookup. This provides the fast user experience you desire.

1. **Reg ID Entry and Verificationin Daily\_Quiz Page:**
   * **Action:** User enters the **Registration ID** and clicks a 'Start Quiz' button.
   * **Web Logic:** The webpage calls an App Script function (validateRegId) to check if the entered ID exists in the 'Registration' sheet./ or check the data itself from the Registartion sheet to verify if the user is registered or not. Implement the best strategy.
   * **Outcome:** If valid, the quiz proceeds; if invalid, an immediate error message is displayed.
2. **Day Code Determination:**
   * **Web Logic:** The webpage determines the current **DayCode** (D0 to D4) based on the client's system date. This value is fixed and sent with the submission.
     + Before 27.10.2025: **D0**
     + 27.10.2025: **D1** (and so on)
3. **Duplicate Submission Check:**
   * **Web Logic:** After successful Reg ID verification, the webpage makes a second App Script call (checkDuplicateSubmission) passing the **Reg ID** and determined **DayCode**.
   * **App Script Response:** The App Script queries the 'Submission' sheet. If an entry exists for that combination, it returns true.
   * **Outcome:** If true, the user is shown a message that they have already answered for the day and the quiz is *not* displayed.
4. **Quiz Flow and Data Submission:**
   * **Timing:** The webpage records **Start Time** (client-side system time) and **End Time** (client-side system time, on submit or auto-submit).
   * **Submission Data:** The webpage gathers and sends the following raw data to the App Script's submission endpoint:
     + Reg ID
     + DayCode
     + Start Time (e.g., 2025-10-16T17:30:00)
     + End Time (e.g., 2025-10-16T17:34:30)
     + Duration – pass as 0 for default app script will do the calculations
     + Q1 Answer...Q10 Answer (A/B/C/D)

### Google App Script Logic (Backend Processing)

The App Script's role is simplified. It acts as the secure API bridge, performing data lookup/verification requested by the webpage, and doing the necessary **calculations** and **scoring** before logging the final data.

1. **API Bridge Functions (For Webpage):**
   * validateRegId(regId): Checks **'Registration'** sheet. Returns true/false.
   * checkDuplicateSubmission(regId, dayCode): Checks **'Submission'** sheet. Returns true/false.
2. **Submission Processing Function (The Core Logic):**
   * **Calculations (Crucial for Sheet Design):**
     + **Scoring:** Compares answers against **'Answer Key'** for the given DayCode and calculates **Total Correct**. **(App Script Responsibility)**
     + Duration: calculate the difference between start time and end time and pass it as Duration in seconds
   * **Email Action 1 (Immediate):** Sends receipt email.
3. **Leaderboard & Post-Quiz Emails:**
   * **Post-Quiz Email Action:** Sends performance email after 4:00 PM (containing Total Correct and Duration).
   * **Leaderboard Generation:** Fetches and ranks participants from the **'Submission'** sheet based on Score, Submission Time, and Duration.