### Overview and Goal

The goal is to implement a **4-day online quiz competition (27.10.2025-30.10.2025 everyday from 12pm – 05 pm)** (plus one practice/test day, D0, upto before 27.10.2025) 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 which has already been developed. The sheet structure and forms structure is ready.

### Data Structure (Google Sheets)

The system uses four main sheets to manage data and backend logic:

| **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**, **Duration,** Q1 Answer... Q10 Answer,**Total Correct (Calculated), Timing bonus (to be calculated at 09pm everyday considering the fact that who among the participants submitted answers early-** Timestamp **and within lesser time**- **Duration; logic will be for submission time 12pm-01pm point 5, 01pm-02pm point 4, …,04pm-05pm point 1 and for Duration within 01 minute 05 points, within 02 minutes 04 points, … , within 05 minutes 01 point. ), Total Score (Total Correct + Timing bonus)** |
| **Leaderboard** | Stores the final ranked scores for display. | Rank (calculated based on **Total Score)**, Participant Name (**Registration sheet)**, Registration ID (**Registration sheet)**, Total Correct (**Submission sheet)**, **Timing bonus (Submission sheet), Total Score(Submission sheet)**. – these columns are to be collected from sheet name written beside each column except Rank which is to be ordered by **Total Score.** |

### 1. Utility & API Bridge Functions (Webpage Interaction)

These functions provide necessary data lookups, validations, and utility operations, primarily acting as the secure API endpoint for client-side requests from the custom web application through google forms.

| **Function** | **Description** | **Sheets Used** |
| --- | --- | --- |
| **norm(s)** | **Utility:** Standardizes string inputs (emails, Reg IDs, answers) by converting to lowercase, trimming whitespace, replacing multiple internal spaces with a single space, and handling null/undefined input. | N/A |
| **getEmailAndNameByRegId(regId)** | **Utility:** Looks up regId in **Registration** and returns the associated **Email Address** and **Full Name**. | Registration |

### 2. Core Processing Logic (Trigger and Backend Processing)

These functions are triggered automatically (via form submit triggers) or run as scheduled jobs, executing the core business logic, calculations, and data logging.

#### 2.1. Registration Processing (onRegistrationSubmit)

* **Trigger:** Executed upon submission to the **Registration** sheet.
* **Registration Uniqueness Check:** If the **Email ID** is a duplicate, the script **deletes the current duplicate row**, sends a **failure notification email**, and **stops execution**.
* **Successful Registration:** If unique, the script:
  1. Generates a unique 08 digit – all numeric- **Registration ID** (e.g., 12345678).
  2. **Writes the generated Reg ID back** to the corresponding cell in the **Registration** sheet.
  3. Sends a **success confirmation email** to the participant, including their assigned **Unique Registration ID** and **Full Name for all future uses**.
* **Error Handling:** Includes try...catch blocks for logging errors and sending an administrative email notification if the success email fails.

#### 2.2. Submission Processing (onSubmissionFormSubmit)

* **Trigger:** Executed upon submission to the **Submission** sheet.
* **Core Calculations (App Script Responsibility):**
  + **Scoring (Total Correct):** Compares the Q1-Q10 answers against the **Answer Key** for the given **DayCode** and calculates the **Total Correct** count.
  + **Duration:** Calculates the difference between **Start Time** and **End Time** and records the result as **Duration in seconds**.
* **Data Logging & Immediate Email:**
  + The calculated **Total Correct** and **Duration in seconds** are logged to the **Submission** sheet.
  + **Email Action 1 (Immediate):** A receipt email is sent to the participant, confirming successful receipt.
* **Timing bonus** - to be calculated at 09pm IST everyday considering the fact that who among the participants submitted answers early- Timestamp and within lesser time- Duration; logic will be for submission time 12pm-01pm point 5, 01pm-02pm point 4, …,04pm-05pm point 1 and for Duration within 01 minute 05 points, within 02 minutes 04 points, … , within 05 minutes 01 point.
* **Total Score -** to be calculated at 09.30 pm IST everyday by summing Total Correct and Timing bonus

### 3. Scheduled & Manual Admin Functions

These functions handle post-submission processes and administrative controls.

* **Post-Quiz Email Action (Scheduled):**
  + Runs on a time-driven trigger (e.g., daily after 6:00 PM).
  + Sends a **performance email** to participants, detailing their results (including **Total Correct** and **Duration**).
* **Leaderboard Generation:**
  + At 11pm IST Fetches data from the **Submission** sheet and writes the ranked results to the **Leaderboard** sheet based on the following criteria (in order of priority): **Total Score** (Highest first)