

Complete Structure of the Program

In this section, we provide a comprehensive overview of the structure of the Zoom meeting automation program. This includes a detailed description of the modules comprising the program and the underlying data structures used.

5.1 Modules and Their Description

1. Setup Process Module

Description: The Setup Process Module orchestrates the initial setup steps necessary for the seamless operation of the Zoom meeting automation program. This module encompasses a series of essential tasks aimed at preparing the environment and ensuring all dependencies are met.

- **Fulfilling Dependencies:** Before the program can be executed, it must satisfy various dependencies. This includes installing necessary libraries and packages that are prerequisites for the program's functionality. The setup process automatically checks for these dependencies and installs them if they are missing.
- **Installing Required Libraries:** The setup process includes the installation of libraries and frameworks essential for the program's operation. This ensures that the program has access to all the necessary tools and resources it needs to function effectively.
- **Configuring MySQL:** As part of the setup process, the program configures a MySQL database to store meeting credentials and other relevant data. This involves creating the required database schema, setting up user permissions, and configuring connection parameters.
- **Setting Up the Daemon Service:** The setup process establishes a daemon service using the regumate.py script. This service runs in the background, continuously monitoring scheduled meeting times and automatically initiating the process to join Zoom meetings at the designated times.

2. GUI Interaction Module

Description: The GUI Interaction Module provides an intuitive and user-friendly interface for users to schedule Zoom meetings conveniently. This module streamlines the process of inputting meeting details and facilitates seamless interaction with the program.

- **User Interface Design:** The GUI module features a well-designed user interface that simplifies the process of scheduling meetings. It presents users

with clear and intuitive controls for entering meeting ID, passcode, meeting time, and duration.

- **Input Validation:** To ensure the accuracy and validity of user inputs, the GUI module incorporates robust input validation mechanisms. It performs checks to verify that the entered meeting details are correctly formatted and within acceptable ranges.
- **Error Handling:** In the event of invalid inputs or other errors, the GUI module provides informative error messages to guide users and prompt them to correct any issues. This proactive approach to error handling enhances the user experience and prevents potential issues from escalating.

3. Daemon Service Module (regumate.py)

- **Description:** The Daemon Service Module, implemented in the regumate.py script, serves as the backbone of the Zoom meeting automation system. This module operates in the background, continuously monitoring scheduled meeting times and orchestrating the automatic joining of Zoom meetings.

- **Meeting Time Monitoring:** The daemon service periodically checks the current time against the scheduled meeting times stored in the database. It ensures that meetings are joined promptly at the designated times, without requiring manual intervention.
- **Automatic Joining of Meetings:** Upon detecting that a scheduled meeting time has been reached, the daemon service initiates the process to automatically join the corresponding Zoom meeting. This involves launching the Zoom application, entering the meeting ID and passcode, and connecting to the meeting.
- **Robustness and Reliability:** The daemon service is designed to operate reliably under various conditions. It includes error handling mechanisms to address potential issues such as network connectivity issues, Zoom application errors, or scheduling conflicts.

4. Error Handling and Validation Processes Module

- **Description:** The Error Handling and Validation Processes Module plays a crucial role in ensuring the robustness and reliability of the Zoom meeting automation program. This module encompasses various mechanisms for validating user inputs, detecting errors, and handling exceptions effectively.
- **Input Validation:** To prevent erroneous inputs from compromising the program's functionality, the error handling module performs comprehensive

input validation checks. It verifies that user-provided data is correctly formatted, within acceptable ranges, and meets predefined criteria.

- **Error Logging:** In the event of errors or unexpected behaviors, the program logs relevant information to facilitate troubleshooting and debugging. Error logs capture details such as the nature of the error, the context in which it occurred, and any relevant system state information.
- **Exception Handling:** The error handling module includes robust exception handling mechanisms to gracefully handle unexpected errors or exceptional conditions. It ensures that the program can recover from errors gracefully and continue operating without compromising overall system stability.

5. Database Interaction Module

- **Description:** The Database Interaction Module facilitates seamless interaction with the MySQL database where meeting credentials and other relevant data are stored. This module handles tasks related to querying, updating, and managing data within the database.

- **Data Retrieval:** The module includes functions to retrieve meeting credentials from the database based on specified criteria, such as meeting time or meeting ID. It ensures efficient retrieval of data for use by other program components.
- **Data Insertion and Update:** When new meetings are scheduled or existing meeting details are modified, the module is responsible for inserting new records or updating existing ones in the database. This ensures that the database remains up-to-date with the latest meeting information.
- **Data Integrity Maintenance:** The module enforces data integrity constraints within the database, such as ensuring that meeting IDs are unique and that meeting times are within valid ranges. It prevents inconsistencies and maintains the reliability of the stored data.

6. Error Handling and Logging Module

- **Description:** The Error Handling and Logging Module ensures robustness and reliability by managing errors and logging relevant information throughout the system's operation. This module helps identify and address issues promptly, ensuring smooth operation and minimizing disruptions.
- **Error Detection and Reporting:** The module monitors the system for errors, exceptions, and unexpected behaviour. When an error occurs, it captures relevant details, such as error messages, timestamps, and stack traces, to facilitate troubleshooting and resolution.

- **Logging Mechanisms:** The module implements logging mechanisms to record important events, actions, and system activities in log files. It logs various events, including user interactions, database operations, and system notifications, for auditing and analysis purposes.
- **Severity Levels:** Logging messages are categorized based on severity levels, such as INFO, WARNING, ERROR, and DEBUG, to prioritize and differentiate between different types of events. This helps administrators identify critical issues and prioritize their resolution accordingly.
- **Centralized Logging:** In distributed or multi-component systems, the module supports centralized logging solutions, such as Elasticsearch or Splunk, to aggregate logs from multiple sources and provide a unified view of system activities for monitoring and analysis.

5.2 Data Structures

1. Database Tables

Meetings Table:-

Description: The Meetings table serves as a central repository for storing essential information related to scheduled Zoom meetings. It plays a crucial role in facilitating the management and execution of meetings within the Zoom meeting automation system.

- **Meeting-ID (Primary Key):** VARCHAR (255) - This field serves as the primary identifier for each Zoom meeting stored in the table. It ensures the uniqueness of each meeting entry within the system, allowing for efficient retrieval and manipulation of meeting data.
- **passcode:** VARCHAR (255) - The passcode field stores the access code required to join a specific Zoom meeting. By securely storing passcodes, the system ensures that only authorized participants can access the respective meeting rooms, thereby maintaining confidentiality and security.
- **Meeting-time:** VARCHAR (255) - This field records the scheduled date and time for each Zoom meeting. By capturing meeting schedules, the system enables timely execution and coordination of meetings according to users' preferences and availability.
- **Total-Meeting:** INT - The total_meeting field represents the duration of each Zoom meeting, specified in minutes. It enables users to schedule meetings for specific durations, ensuring efficient allocation of time and resources for productive collaboration.

Field	Type	Null	Key	Default	Extra
id	int	NO	PRI	NULL	auto_increment
meeting_id	varchar(255)	NO		NULL	
passcode	varchar(255)	NO		NULL	
meeting_time	varchar(255)	YES		NULL	
total_meeting	int	YES		NULL	

Fig: Meetings tables structure

Users Table:-

Description: The Users table stores essential information about system users, including their credentials and access privileges. It plays a critical role in user authentication and access control within the Zoom meeting automation system.

- **User-ID (Primary Key):** INT - This field serves as the unique identifier for each user registered in the system. It ensures the uniqueness of user entries and facilitates efficient retrieval and management of user-related data.
- **username:** VARCHAR (255) - The username field stores the login credentials associated with each user account. By using usernames for authentication, the system enables secure access to user-specific functionalities and resources.
- **password:** VARCHAR (255) - This field stores encrypted passwords corresponding to user accounts. By securely storing passwords, the system ensures protection against unauthorized access and maintains the confidentiality of user data.
- **role:** VARCHAR (255) - The role field specifies the access level or user role assigned to each user account (e.g., admin, regular user). It determines the permissions and privileges granted to users, dictating their level of access to system functionalities and resources.

2. Log Files

Error Log File

Description: The Error Log file serves as a critical tool for diagnosing and resolving errors and exceptions encountered during system operation. It plays a vital role in ensuring the reliability and stability of the Zoom meeting automation system.

- **Timestamp:** Date and time of the occurrence of each error or exception. It provides precise timing information for identifying and analyzing system issues.

- **Error Message:** Detailed description of the error or exception encountered. It provides valuable insights into the nature and cause of system failures, aiding developers in debugging and troubleshooting efforts.
- **Stack Trace:** Sequence of function calls leading to the occurrence of the error. It helps developers pinpoint the exact source code location where the error occurred, facilitating efficient resolution of issues.

Main Log File

Description: The Main Log file captures a broad range of system activities and events for monitoring and analysis purposes. It provides valuable insights into the overall operation and performance of the Zoom meeting automation system.

- **Timestamp:** Date and time of each logged system event or activity. It enables tracking and analysis of system behaviour over time, facilitating performance evaluation and optimization efforts.
- **Log Level:** Severity level assigned to each logged message (e.g., INFO, DEBUG, ERROR). It categorizes log messages based on their importance and urgency, allowing for prioritization of system events and activities.
- **Message:** Description of the logged system event or activity. It provides contextual information about the nature and significance of each logged entry, facilitating comprehensive system monitoring and analysis.

These data structures, including database tables and log files, play integral roles in the storage, management, and analysis of data within the Zoom meeting automation system. They contribute to the system's efficiency, reliability, and scalability, ensuring seamless scheduling, execution, and monitoring of Zoom meetings while enabling effective error handling and system performance evaluation.