Redis data structures

1. Session Management

- Redis Data Structure: Redis Strings and Hashes
- Key: session:{sessionId}
- Value: Hash data structure where fields are userId, authToken, lastActive, etc.
- Usage: Each session is stored as a hash keyed by the session ID. This allows rapid retrieval and updating of session-related information such as authentication tokens and timestamps. Redis's ability to set expiration times on keys (EXPIRE command) can be used to automatically handle session expiration.

2. Leaderboards

- Redis Data Structure: Redis Sorted Sets
- Key: leaderboard:{gameId}:{categoryId}
- Value: User IDs or run IDs as members with scores being the negative value of completion times (to rank faster times higher).
- Usage: Each game and category combination has its own sorted set. Updates to run data are reflected by adding or updating scores in the relevant sorted set, allowing for real-time ranking and retrieval.

3. Real-Time Notifications

- Redis Data Structure: Redis Pub/Sub
- Channels: Channels named after types of notifications, e.g., events, records, announcements.
- Value: Messages are published to channels with content regarding the notification.
- Usage: Application components subscribe to relevant Redis channels and listen for messages. When a new event or update occurs, a message is published to the appropriate channel, which is instantly pushed to all subscribers.

4. User Preferences and Settings

- Redis Data Structure: Redis Hashes
- Key: userPrefs:{userId}
- Value: Hash where each field represents a setting or preference, such as displayMode, favoritePlayer, etc.
- Usage: User settings are stored in a hash keyed by the user ID. This makes it easy to quickly fetch and update individual preferences, even across different sessions.

5. Most Viewed Runs

- Redis Data Structure: Redis Sorted Sets

- Key: mostViewedRuns
- Value: Run IDs as members with scores being the view counts.
- Usage: This sorted set tracks all runs by their popularity. Each view increments the score for a run ID, keeping the runs ranked by view count. This allows for quick retrieval of the most popular runs at any given time.