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Gigapaxos Application Design Document

Purpose

The Gigapaxos application, named MyDBReplicableAppGP, is designed to act as a replicable service interfacing with a Cassandra database. The application is expected to execute requests, handle checkpoints, and restore states based on the provided design.

Components

Request Execution:

The execute method handles the execution of requests.
It extracts the request from the incoming string.
It translates the request into a corresponding Cassandra query and executes it on the Cassandra database .
The method returns true upon successful execution and false if an exception occurs during execution.

Checkpointing:

The checkpoint method retrieves the current state of the Cassandra database table named "grade" and returns the result as a string.
It utilizes the SELECT query to fetch all rows from the "grade" table.
The result is expected to be a serialized form of the database state, which can be stored for later restoration.

Restoration:

The restore method is responsible for restoring the application state from a given checkpoint string.
It uses a regular expression pattern to extract key-value pairs from the checkpoint string, where each key represents an integer, and the corresponding value is a list of integers.

```
Row\\[(-?\\d+), \\[([^\\]]*(?:\\[.*?\\][^\\]]*)*)\\]\\]
```

This regex basically gives the row keys and row values which we store it in a hash map.
Now we write an insert command which inserts the keys and their corresponding value arrays in the table grade.
This is how restore is done.

Result:

Consistently all the test cases passed, but at few instances , one of the test case randomly failed.