

# CS 578

## Programming Assignment - 4.1

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### Design:

This design is for implementation of datastore (key-value) with GigaPaxos RSM. This design uses GigaPaxos for fault tolerance, ordering, and replication while accepting SQL-style requests (CQL commands) encoded as strings inside GigaPaxos request packets and executing them on a Cassandra backend.

### MyDBReplicableAppGP.java

#### Architecture:

- GigaPaxos: External framework to provide consistency, replication and request handling.
- MyDBReplicatedAppGP: Application; Implements the replicable class; processing requests, cassandra execution etc.
- Cassandra Backend: This is the data storage for replicated state in this implementation.

#### Initialisation and Schema:

- Read the keyspace name from args[0].
- Connects to a Cassandra cluster.
- Creates the keyspace if missing.
- Creates a simple grade(id text PRIMARY KEY, event int) table.

## Request:

- GP will wrap the request inside a json object.
- The code will extract the CQL command from the json object and use that to execute on cassandra.

## Checkpointing:

- GigaPaxos expects snapshot/restore functionality to reconstruct the replicated state machine's logical snapshot.
- This will return a json state of the replica. This is done so that it is parsable.

## Restore:

- This is used to restore the state from the checkpoint.
- It parses the json and reinstates the id and event.

## Failing:

- All the test cases pass.

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succeeded
.test49_DropTables succeeded
.test99_closeSessionAndServers succeeded
Time: 159.377
OK (13 tests)
mauli@MacBook-Air-5 fault-tolerant-db %
```

Previous failures:

- Good parsing to convert from the json to CQL format.
- State mismatch error due to incorrect entry split due to curly brackets
- Some errors on Cassandra due to incompatibility with MacOS. Stack size etc.