

Assignment for Software Engineering Intern Role (Backend) at Leap

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Problem Statement

Build a file-based key-value data store that supports the basic CRD (create, read, and delete) operations.

Technology and Framework Used

Java 1.8 Version

IDE : IntelliJ

Note

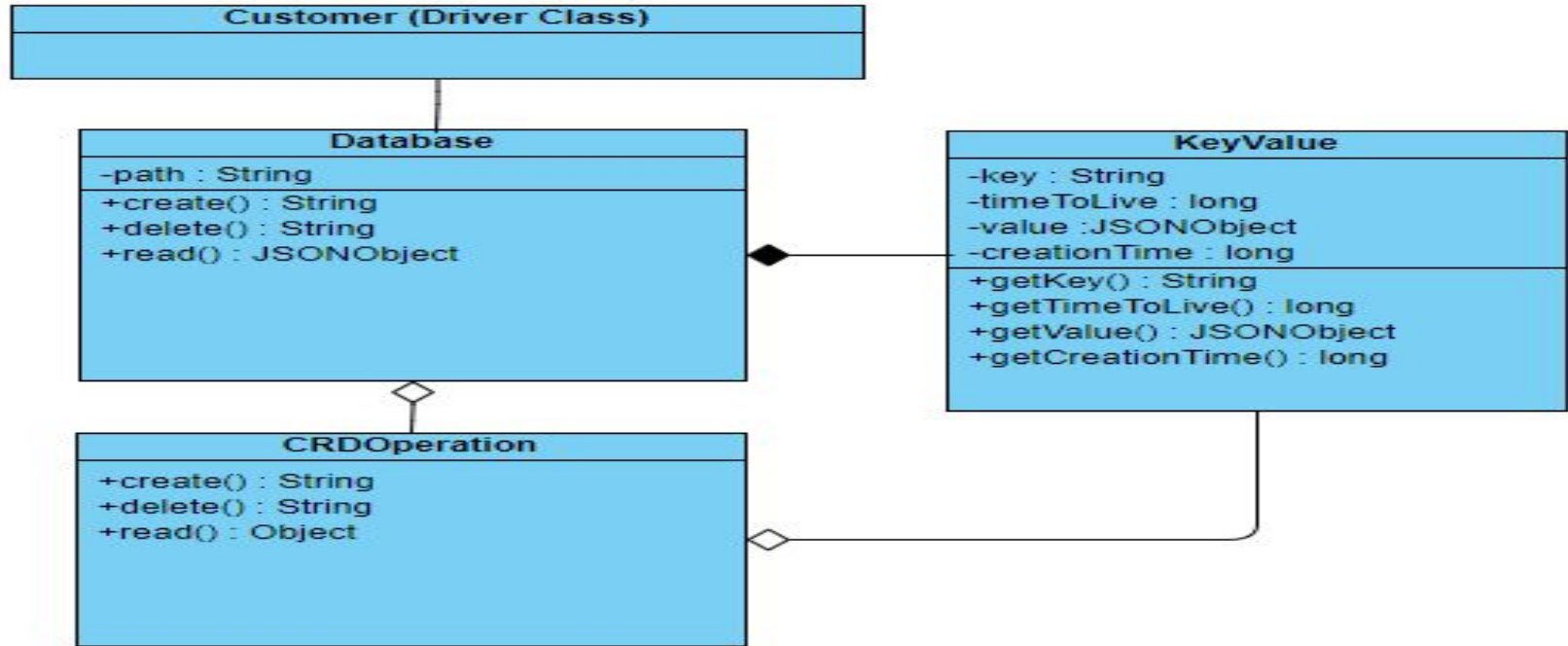
To run the program JSON Jar file required (`org.json.simple.JSONObject`)

Approach

We found out Following Entity

- 1) Database: (It act as whole system and Instancation of this class Object will allow CRD operations).
- 2) KeyValue: (This class is for Organizing the data with all the specified properties).
- 3) CRDOperation: (This class act as utility class that contains several utility methods that can be used by any Customer concurrently).
- 4) Customer: (This class is responsible to test the functionalities of that Database)

Class Diagram



Various Approaches used for different types of Problems

Synchronization Problem :- Software can be instantiated by any number of users. And Accessing their Data Securely in Thread Safe manner. For thread safety I used Reentrantlock for Synchronization that are without busy waiting problem.

Data Consistency :- We are direct reading data from files and Updating the data directly into the file.

TimeToLive Problem :- When any request is occur for accessing any data key(Entry) read the data from the file and first check whether it's timeToLive is expired or not. $\text{if}(\text{CurrentTime} > (\text{CreationTime} + \text{TimeToLive}))$ Time Expired

else Element is still present

If expire the remove that entry from file and update the file with remaining entry.

Thank you!