Lab 1 Phase A Design

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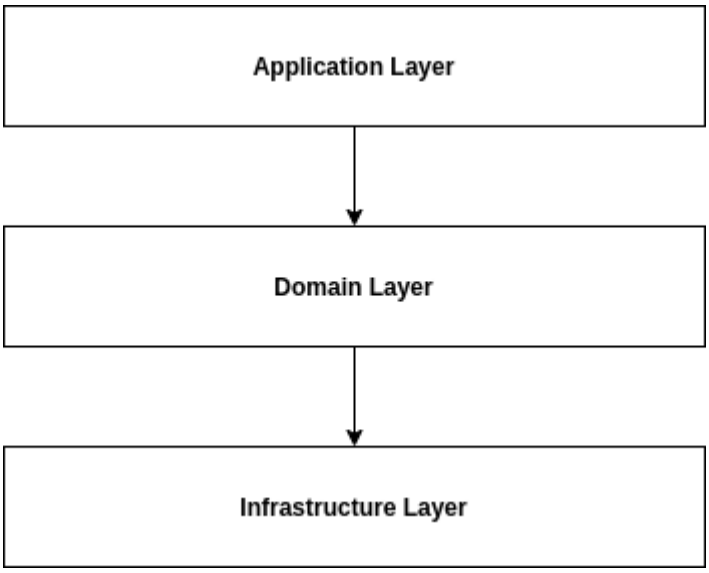
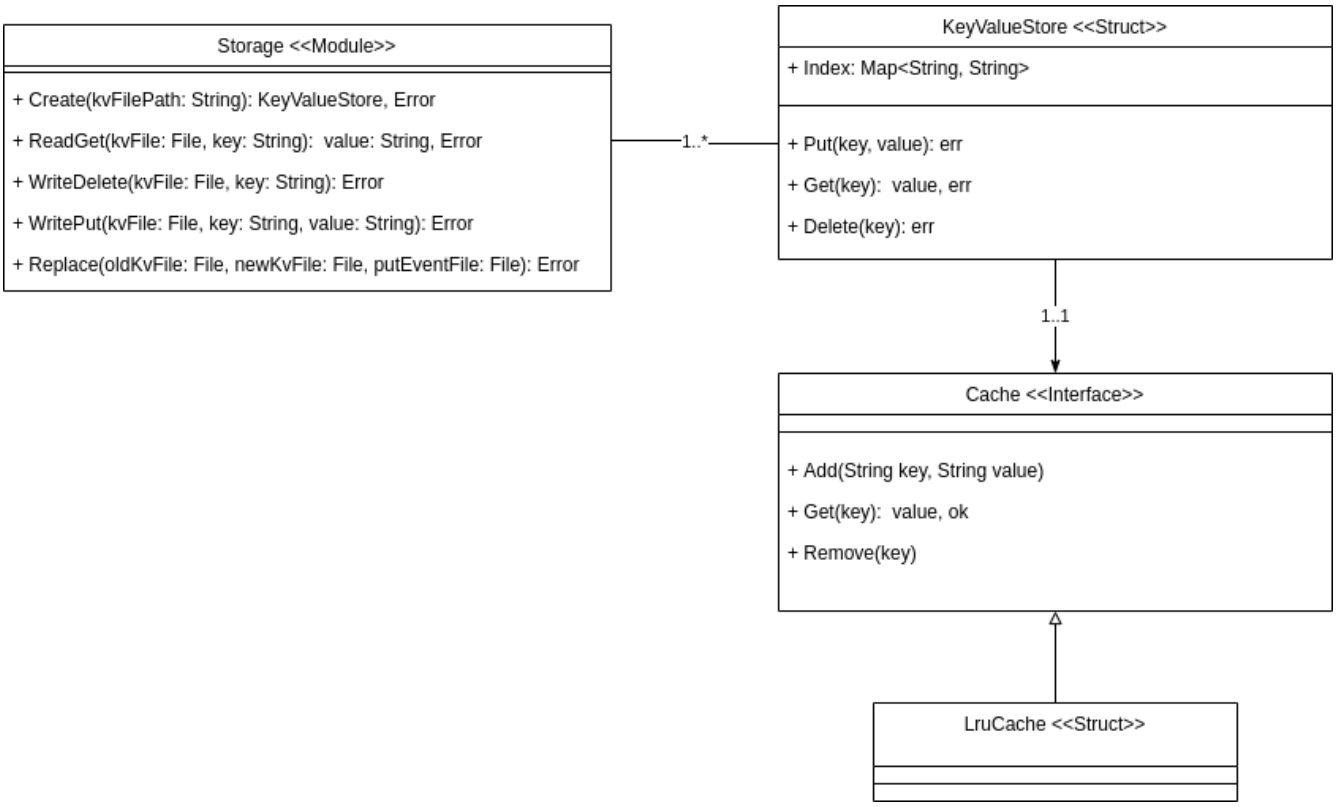
Layers



Each layer only communicates with layers below it, to allow for easier changes, where the following are the layer responsibilities:

- Application layer is responsible for controller logic:
  - Creating internal structures and processes
  - Loading in any configurations
  - Routing user input and output to internal processes via the domain layer.
- Domain layer is responsible for core logic:
  - Key value store itself
  - Key value data management between in memory and disk
- Infrastructure layer is responsible for low level IO and utility related code, not closely related to the key value store domain.

Domain Layer



1. At the start of the program, the storage module function Create, creates the key value store with an Lru Cache.
2. For any of the ongoing operations before the program ends involving the KeyValueStore:
    - Any get operations will first check the Lru cache. If the key value pair is not in the cache, then the key value pair will be read from the disk (refer to storage for details on file usage).
    - Any put operations will result in the key value pair being added to cache and written to disk refer to storage for details on file usage).
    - Any delete operations will result in the key value pair, if in cache or on disk, being removed from cache and deleted from disk refer to storage for details on file usage).

Storage File

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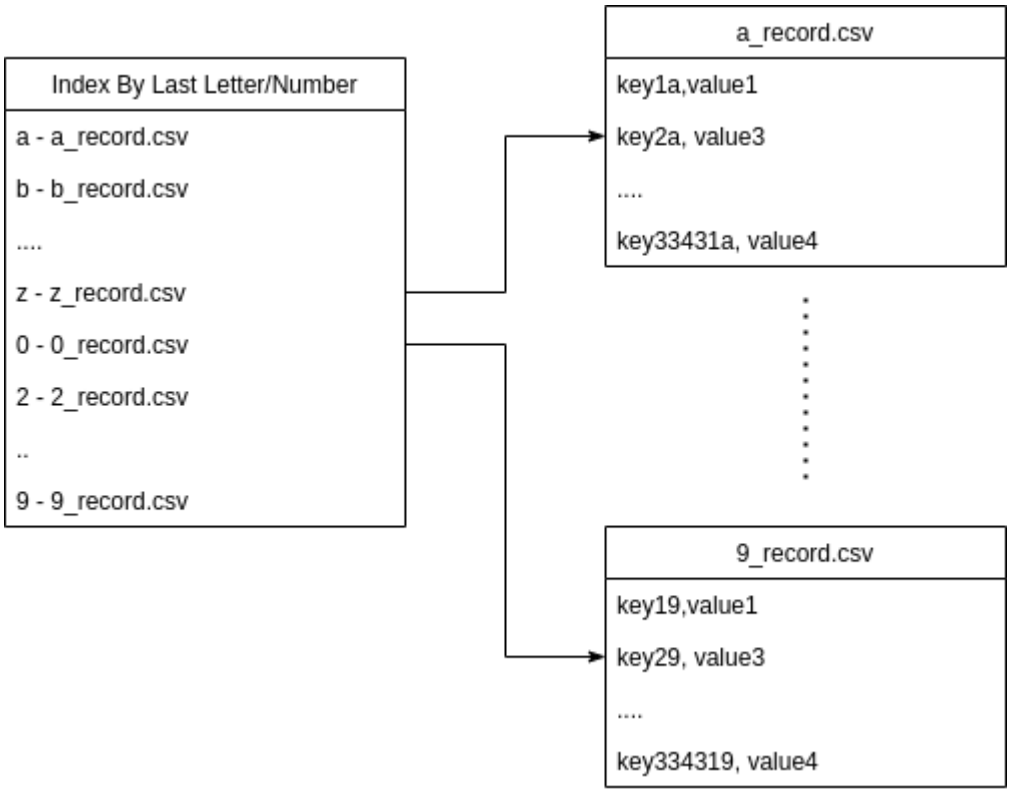

- Data stored on the disk are indexed by the last character in the key string.
- An in memory index will be used to get the appropriate record file path by using the last character of the given key.
- If the record file does not exist yet, no puts have been done before, an record file will be created.