Summary

I think the goal of the project is to implement a distributed file system via TCP/UDP socket. This assignment implements a single-threaded key-value storage server. It can scale to a large distributed storage server cluster that serves a lot of clients requests.

As to the implementation of the project, my first thought was to use pure String to send operation type, key and value. However I found that it more scalable and robust to send those information via an object. For example, if we want our key-value storage system to use object as key and value instead of String. It was difficult at first to send and receive object via socket connection. I did some research and found the key points are using a serializable object and transfer object in bytes. My implementation of this message class only contains Operation, Key and Value. However it can expand to a more complete class including status, message type, timestamp and etc.

Another thing of the implementation is that the TCP server and the UDP server (and the TCP client and the UDP client) share a lot of methods and variables. Generally speaking both the server and the client should implement a Send and a Receive function. Since some of the function implementations are same while some are not, I decided it best to define abstract class Server and Client.