Assignment Overview

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In this project, I implement paxos, which is an algorithm to solve consensus problem in distributed system. As in project 3, the coordinator version, i.e. the two-phase commit version needs all the servers agrees on certain changes, the updated is committed after that. However, in real-world situation, we cannot make all the machines across the internet work properly and get responses from all of them, and the strong consistency is impossible and unnecessary to maintain. As a result, we only need the majority of machines agree on one goal, and we can improve our efficiency greatly. This is why Paxos is so popular nowadays. This assignment is to let us understand how Paxos works, and how to implement it in a kv-store. Also, as Paxos is less intuitive compared to 2-phase protocols and other algorithms, it is better to implement it by ourselves to understand the details.

Also, it is important to understand fault tolerance and failures by ourselves, as this is common in industry. Also, in real world, most of things are working concurrently, so we need to use threads and mimic the performance. The concept of proposer, acceptor, learner will tell us how consensus can be made by majority of people when some of them failed or have no response.