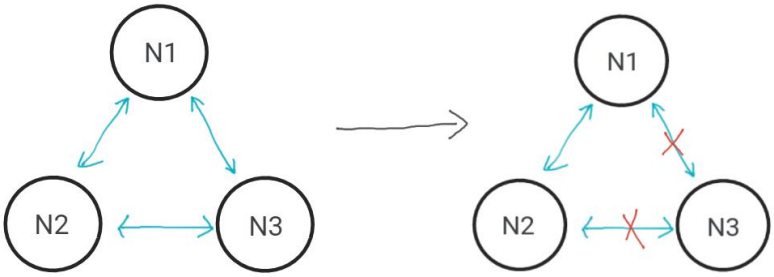
Large Scale Computing – lab 6

1. Exercise 1



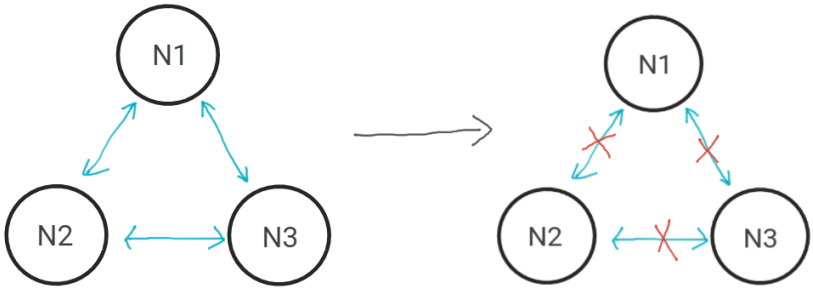
Pre-Partition: All nodes see and can update the same AtomicLong value due to their connectivity.
During Partition:

Isolated Node (N3): Lose the ability to read or update AtomicLong due to a lack of quorum, maintaining CP guarantees.

Connected Nodes (N1 and N2): Can read and update AtomicLong due to having quorum.

Post-Partition Healing: The nodes synchronize, and the latest consistent AtomicLong value is reflected across all nodes after the partition heals.

2. Exercise 2



Pre-Partition: All nodes see the same AtomicLong value, and changes propagate correctly.
During Partition: Each node is isolated and cannot form a quorum with any other node, which prevents both read and write operations on AtomicLong.
Post-Partition Healing: After the partition heals, all nodes eventually synchronize to the last known consistent value of AtomicLong from before the partition. Hazelcast's CPSubsystem resolves any discrepancies through quorum-based consensus.

3. Exercise 3
You can always get and increment PNCounter , but if you introduce simulated partition, the values are no longer consistent. That is because nodes that is cut off from the rest does not know about sibling incrementation.

4. Which data structures -- AP or CP -- require the Raft algorith? Why is this algorithm needed?

   CP, because we want to know what is our to be achieved consistency. If we have some nodes with different values without the leader, we would not know which has more important information.

5. Read-Your-Writes (RYW) ensures that a client sees its updates immediately within the same session, even if other nodes haven't fully synchronized.

   Monotonic Reads guarantee that a client's subsequent reads in the same session won't reflect a "stale" or earlier value

   These properties are "guaranteed":
   - the storage system ensures them for each read and write operation belonging to a session
   - it informs the calling application that the guarantee cannot be met.

   The guarantees of Read-Your-Writes and Monotonic Reads provided by PNCounter are session guarantees because they only apply within the context of a single continuous interaction (session) with the distributed system.