CS5320: Distributed Computing, Spring 2020

Theory Assignment 3: Solving Consensus using Byzantine Agreement

SAI HARSHA KOTTAPALLI

CS17BTECH11036

If the assumption that majority process being nonfaulty does not hold is true then:

- **Termination** will hold true as interactive consistency protocol will eventually terminate.
- **Agreement** : Agreement: Clearly, all nonfaulty processes agree on all entries of their vectors. So whatever they decide on, the majority will be the same for all of them(non faulty).
- **Validity**: The validity property of the interactive consistency protocol guarantees that if process Pi is nonfaulty, then all nonfaulty processes will decide on vi as the ith component of their respective vectors. But since, the non faulty processes are not the majority it is possible that most processes choose default value in which there is a chance validity holds. But it is not always the case, since, it is entirely possible that all the faulty processes propose a different value from intended but same, then the majority would not be equal to that proposed by non faulty process. So validity is violated.

Hence, the proof of correctness would be violated. The algorithm is no longer valid.