Submission: Tuesday, September 28 by 2pm on Gradescope.
Homework solution must be typed. You must work on this by yourself – no collaboration is allowed.

Homework

1. (20) Show a scenario that does not work with only f rounds, for n processes, n>f+1, for any (all possibilities of) n and f.
2. (40) Prove that the original algorithm (with f+1 rounds) is correct.

Hints:

- First, list what properties are needed to be proven, then prove them.
- Remember: no process decides before the *f*+1 round.
- Think about where vector values are coming from.
- Show that the values of the local vectors are identical at all the processes that make it to the *f*+1 round (why?) .

3. (20) What is the best way to change the algorithm if messages may (or may not) be delayed such that each message may arrive in the next round rather than only in the round in which it was sent?

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Homework (cont.)

4. (20) Suppose that n=4, and at most one process may lie (say whatever it wants, and maybe different things to different members, or maybe not say anything to some members on some messages). Construct the simplest algorithm that solves the consensus problem in this case.

Validity in this case: If a correct process decides on a value, there was a correct process that started with that value.