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Communication in Parallel Systems

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Assignment 9

Problem 16 (4 points)**:**
Present a consistent strategy, based on several copies of a memory cell, that ensures that both read and write requests only have to access a subset of the copies to be processed correctly. Of course, using many copies can create a high storage overhead. Find a technique (based, for instance, on parity codes) that allows to ensure on the one hand that both read and write requests only have to access a subset of the pieces stored for a memory cell and on the other hand only involves to store (at most) twice as much information compared to the case of one copy per memory cell.

Problem 17 (4 points)**:**
Show that also the ARBITRARY DMM only requires $O(\log \log n)$ steps to simulate a read step of an EREW PRAM if every memory cell is stored twice. Use a witness tree argument for this similar to the one used for the c-COLLISION DMM, neglecting dependencies among the objects embedded into the tree.