

## Exercise 2

**Problem 1.** Explain the difference between a regular register and an atomic register. Provide an example execution that is allowed for a regular register but not allowed for an atomic register.

**Problem 2.** Consider the transformation from binary MRSW regular registers to multi-valued MRSW regular registers. Prove that the transformation does not work for atomic registers. In other words, assuming that we have binary MRSW atomic registers, show that the transformation does not provide multi-valued MRSW atomic registers.

**Problem 3.** Consider the transformation from binary regular to M-valued MRSW regular registers given in class. Prove that if the Write operation would first write 0, and then 1, the transformation would not work (by providing a counterexample that breaks regularity).

**Problem 4.** Consider the transformation from SRSW regular to SRSW atomic registers given in class. Prove that if you replace the base registers (SRSW regular registers) by MRSW regular registers, your algorithm does *not* yield an MRSW atomic register (by providing a counterexample that breaks atomicity).