

Exercise 7

Problem 1.

Recall the *commit-adopt object* seen in class, which has the following specification. Every process proposes an input value to such an object and obtains an output value, either in a committed or adopted status. The following properties are satisfied:

- **Validity:** The output value of any process is an input value of some process.
- **Agreement:** If a committed value is returned to a process, then no different output value (committed or adopted) can be returned to any other process.
- **Progress:** Every correct process that proposes an input value obtains an output value.
- **Commitment:** If no two input values are different, then no output value can be adopted. (It is necessarily committed).

Your task is to provide a protocol that solves *obstruction-free consensus* (see below) using (any number of) commit-adopt objects and atomic registers.

Obstruction-free consensus satisfies the following properties:

- **Obstruction-Free-Termination:** If a correct process proposes and eventually executes alone, then the process eventually decides
- **Agreement:** No two processes decide differently
- **Validity:** Any value decided must have been proposed