STiDC'08: Exercise 2

October 6, 2008

1 Problem

Write an algorithm that implements an atomic M-valued SWMR register using (any number of) atomic binary SWMR registers. Try also the following tasks.

1. Prove your algorithm correct.
2. Explain whether your algorithm remains correct (i.e., implements an atomic register) if you change the binary base registers from atomic to regular.

2 A Solution

```
operation write(v)
    r[v].write(1);
    for i ← v − 1 downto 0 do r[i].write(0);
    return ok;
end

operation read
    v ← 0;
    while r[v].read = 0 do v ← v + 1;
    for i ← v − 1 downto 0 do
        if r[i].read = 1 then v ← i;
    end
end
```