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EWD 504: Erratum and embellishments of EWD503

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Erratum and embellishments of EWD503.

Erratum: the text of the procedure "release" on page EWD503 - 2 should begin as follows.

    proc release:
        if busy = busy := false;
            upsweep := (upsweep, qu1); downsweep := (downsweep, qu2);
            if ... etc.
        To keep the interpunction consistent, I should have used a colon in line 6:

    proc request(dest: cylinder):
        * * *

First embellishment: the text of the procedure "endwrite" on page EWD503 - 1 is no longer "quite nice", since I discovered the alternative:

    proc endwrite:
        if aw = 1 -> aw := 0; writers := (head(readers), writers);
        me := head(writers)
    fi

corp endwrite;

When there are both readers and writers waiting, it avoids the final unnecessary activation of the oldest writer. Clearly, "shunting" is something I still have to learn!

    * * *

Second embellishment: C.S.Scholten pointed out to me, that theisch head
monitor of C.A.R.Hoare, and therefore also the one on page EWD503 - 2 has on
a macroscopic scale a danger of individual starvation. If direction = up and
the train "upsweep" is not empty --more precisely: contains requests with
dest > headpos-- a continuous stream of requests with dest = headpos can
cause the requests in upsweep never to honoured. The moral of the story is
that requests with dest = headpos have to be placed in the other stream! The
remedy seems to be, to replace line 9 by

        if dest > headpos or dest = headpos and direction = down ->
and line 17 by

        if dest < headpos or dest = headpos and direction = up -

Wasn't that a nice pitfall? And then to think that there are still people that
still refuse to believe that programming is difficult.....

    * * *

Remark about the devious influence of the programming language we are
using: if I had been trained to think in PL/I with its horrible "BEGIN statement
"END statements" and "RETURN statements" the invention as described in EWD501
in which the notion of "the dynamically last statement of a monitor procedure"
pays a role, would probably not have been made! Again a frightening thought!

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