Multiple readers, single writer concurrency control

Many readers may read simultaneously, a writer must have exclusive access
Assume writers have priority

ar is the count of active readers
rr is the count of reading readers
aw is the count of active writers
ww is the count of writing writers
(but they must take turns to write one-at-a-time)

readers’ code

become active reader
(ar = ar+1)
if no active writers
then proceed to read
(rr = rr+1)
else defer to writers
(await aw = 0)

write

write

writers’ code

become active writer
(aw = aw+1)
if no reading readers
then proceed to write
(ww = ww+1)
else await no readers
(rr = 0)

claim turn to write
WRITE
release claim

ar = ar-1
rr = rr-1
if rr = 0
then wake up waiting writers
exit

aw = aw-1
ww = ww-1
if aw = 0
then wake up waiting readers
exit

mutual exclusion (to access shared counts)

condition synchronisation