Readers and Writers: Monitor Solution

Variables:

lock lock;

① readers wait until writing finishes
② writers wait until reading finishes
③ writers wait until reading finishes

int num_readers = 0
int num_writers = 0
CondVar wait_to_write
CondVar wait_to_read

read(){

begin_read()

lock->acquire()
while (num_writers > 0 || wait_to_read->wait())
num_readers ++
lock->release()

<read>

end_read()

lock->acquire()
num_readers --
if (num_readers <= 0 && wait_to_write->signal())
lock->release()

}

write(){

lock->acquire()
while (num_readers > 0 || num_writers > 0)
wait_to_write->wait()
num_writers ++

<write>

num_writers --
if (num_writers > 0 && wait_to_write->signal())
else wait_to_read->broadcast()

lock->release()

}