Second Readers-Writers Problem

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1 Readers-Writers Problem

In the readers-writers problem there are some processes (termed readers) who only read the shared data, and never change it, and there are other processes (termed writers) who may change the data in addition to or instead of reading it. There is no limit to how many readers can access the data simultaneously, but when a writer accesses the data, it needs exclusive access.

The second readers-writers problem gives priority to the writers. In this problem, when a writer wants access to the data it jumps to the head of the queue - All waiting readers are blocked, and the writer gets access to the data as soon as it becomes available. In this solution the readers may be starved by a steady stream of writers.

1.1 Code

```
import sys

lock = 0
no_of_readers = 0

def reader():
    global no_of_readers
    print("Input: Reader")
    if lock:
        print("A wirter has acquired the lock, please wait till it relea
        return
    else:
        no_of_readers += 1
        print("The reader can read.")
```

```
def release_reader():
    global no_of_readers
    if(no_of_readers == 0):
        print("No readers")
    else:
        no_of_readers -= 1

def writer():
    global lock
    if lock:
        print("Another writer is reading.")
    else:
        print("Writer can write")
        lock = 1
def release_writer():
    global lock
    if lock == 0:
        print("No writer is writing")
    else:
        lock = 0

while True:
    read = input()
    if read == 'read':
        reader()
    elif read == 'write':
        writer()
    elif read == 'relread': # release reader
        release_reader()
    elif read == 'relwrite': # release writer
        release_writer()
    else:
        sys.exit()
```

2 output

Figure 1: second-readers-writers