

Solution

1. **readcount** (variable) to keep track of the number of readers currently reading
2. **mutex** (binary semaphore) to synchronize the access to `readcount`
3. **writer_or_readers** (binary semaphore) to provide exclusive access to each writer or all readers
 - writer should wait before writing and signal after
 - readers should wait when `readcount` goes from 0 to 1 and signal when `readcount` goes from 1 to 0

Readers Writers

```
readcount = 0
sem_init(&mutex, 1)
sem_init(&writer_or_readers, 1)
```

```
void writer () {
    while(1){
        sem_wait(&writer_or_readers)
        write(file, data)
        sem_signal(&writer_or_readers)
    }
}
```

```
void reader () {
    while(1){
        sem_wait(&mutex)
        readcount += 1;
        if (readcount == 1)
            sem_wait(&writer_or_readers)
        sem_signal(&mutex)
        data:=read(file)
        sem_wait(&mutex)
        readcount -= 1;
        if (readcount == 0)
            sem_signal(&writer_or_readers)
        sem_signal(&mutex)
    }
}
```