

Readers Writers

```
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)  
    }  
}
```

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

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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)
    }
}
```

© **Writers starvation!**

Readers Writers

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

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

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