

1. 信号量定义

```
readSwitch = Lightswitchc)
writeSwitch = Lightswitchc)
noReaders = Semaphore(1)
noWriters = Semaphore(1)
```

Reader:

```
noReaders.waitc)
readSwitch.lockcno Writers)
noReaders.signalc)
readSwitch.unlockcno Writers)
```

Writer:

```
writeSwitch.lockcno Readers)
noWriters.waitc)
noWriters.signalc)
writeSwitch.unlockcnoReaders)
```

2. 信号量定义

```
eating = waiting = 0.
mutex = Semaphore(1)
block = Semaphore(0)
must-wait = False.
```

```
mutex.waitc)
```

if must-wait:

```
waiting += 1
```

```
mutex.signalc)
```

```
block.waitc)
```

else:

```
eating += 1.
```

```
must-wait = (eating == 5)
```

```
mutex.signalc)
```

```
mutex.waitc)
```

```
eating -= 1
```

```
if eating == 0
```

```
n = min(cwaiting, 5)
```

```
eating += n
```

```
waiting -= n
```

```
must-wait = (eating == 5)
```

```
block.signalcn)
```

```
mutex.signalc)
```

3. 信号量定义

```
mutex = semaphore(1)
```

```
empty = semaphore(n)
```

```
odd = semaphore(0)
```

```
even = semaphore(0)
```

P1:

do{

```
    int num = produce();
```

```
    empty.wait();
```

```
    mutex.wait();
```

```
    put(num);
```

```
    mutex.signal();
```

```
    if (num % 2 != 0:
```

```
        odd.signal();
```

```
    else:
```

```
        even.signal();
```

```
} while (true)
```

P2:

do{

```
    odd.wait();
```

```
    mutex.wait();
```

```
    getodd();
```

```
    mutex.signal();
```

```
    empty.signal();
```

```
    counter++;
```

```
} while (true)
```

P2:

do{

```
    odd.wait();
```

```
    mutex.wait();
```

```
    getodd();
```

```
    mutex.signal();
```

```
    empty.signal();
```

```
    countodd++;
```

```
} while (true)
```


4. 信号量定义

```
insertMutex = Semaphore(1)
```

```
noSearcher = Semaphore(1)
```

```
noInserter = Semaphore(1)
```

```
searcher = 0
```

```
inserter = 0
```

```
SearcherMutex = Semaphore(1)
```

```
inserterMutex = Semaphore(1)
```

搜索者:

```
searcherMutex.wait()
```

```
searcher++
```

```
if searcher == 1.
```

```
noSearcher.wait()
```

```
searcherMutex.signal()
```

```
searcherMutex.wait()
```

```
searcher--
```

```
if searcher == 0.
```

```
noSearcher.signal()
```

```
searcherMutex.signal()
```

插入者:

```
noSearcher.wait()
```

```
noInserter.wait()
```

```
noInserter.signal()
```

```
noSearcher.signal()
```

插入者:

```
insertMutex
```

```
inserter
```

```
inserterMutex.wait()
```

```
inserter++
```

```
if inserter == 1.
```

```
noInserter.wait()
```

```
inserterMutex.signal()
```

```
insertMutex.wait()
```

```
insertMutex.signal()
```

```
inserterMutex.wait()
```

```
inserter--
```

```
if inserter == 0
```

```
noInserter.signal()
```

```
inserterMutex.signal()
```