生产者-消费者问题

严晟嘉 09013119

本程序在 Window 7 下编写，经过测试运行正确。

使用了WINAPI。

缓冲区是一个长度为BUFFER_SIZE的数组，按循环数组处理。

创建了2个WIN32线程

- 生产者线程 DWORD WINAPI Producer(LPVOID)
- 消费者线程 DWORD WINAPI Consumer(LPVOID)

创建了3个信号量

- HANDLE mutex; // 互斥信号量，用于线程间的互斥
- HANDLE full; // 当缓冲区满时迫使生产者等待
- HANDLE empty; // 当缓冲区空时迫使消费者等待

工程由Visual Studio创建，在Visual Studio中打开运行即可。

运行结果：

```
4: 0
Consuming 5 ... Succeed
Producing 8 ... Succeed
Inserting a product ... Succeed
0: 6 <-- next Consume
1: 7
2: 8
3: 0 <-- next Produce
4: 0
Removing a product ... Succeed
0: 0
1: 7 <-- next Consume
2: 8
3: 0 <-- next Produce
4: 0
Consuming 6 ... Succeed
Producing 9 ... Succeed
Inserting a product ... Succeed
0: 0
1: 7 <-- next Consume
2: 8
3: 9
4: 0 <-- next Produce
Removing a product ... Succeed
0: 0
1: 0
2: 8 <-- next Consume
3: 9
4: 0 <-- next Produce
Consuming 7 ... Succeed
Producing 10 ... Succeed
Inserting a product ... Succeed
0: 0 <-- next Produce
1: 0
2: 8 <-- next Consume
3: 9
4: 10
Removing a product ... Succeed
0: 0 <-- next Produce
1: 0
2: 0
3: 9 <-- next Consume
4: 10
Consuming 8 ... Succeed
```