

Chapter 30

1. The file implements a producer and a consumer using conditional variables and locks.
2. Tried buffer sizes 1-3, behavior does not change.

```
luayan@LAPTOP-111L4GAE:~/chapter30$ ./main-two-cvs-while -l 3 -m 3 -p 1 -c 1 -v
NF      P0 C0
0 [*---] p0
0 [*---] c0
0 [*---] p1
1 [u 0 f---] p4
1 [u 0 f---] p5
1 [u 0 f---] p6
1 [u 0 f---] c1
1 [u 0 f---] p0
0 [*---] c4
0 [*---] c5
0 [*---] c6
0 [*---] c0
0 [*---] p1
1 [u 1 f---] p4
1 [u 1 f---] p5
1 [u 1 f---] p6
1 [u 1 f---] c1
0 [*---] c4
0 [*---] p0
0 [*---] c5
0 [*---] c6
0 [*---] p1
0 [*---] c0
1 [f--- u 2] p4
1 [f--- u 2] p5
1 [f--- u 2] p6
1 [f--- u 2] c1
0 [*---] c4
0 [*---] c5
0 [*---] c6
1 [uEOS f---] [main: added end-of-stream marker]
1 [uEOS f---] c0
1 [uEOS f---] c1
0 [*---] c4
0 [*---] c5
0 [*---] c6
Consumer consumption:
C0 -> 3
```

The max value of num_full should be equal to buffer size.

3.

Windows PowerShell

```
PS C:\Users\yong\Desktop\chapter30> .\main-two-cvs-while.exe -l 3 -m 1 -p 1 -c 1 -v
NF      P0 C0
0 [*---] p0
0 [*---] p1
1 [* 0] p4
1 [* 0] p5
1 [* 0] p6
1 [* 0] p0
1 [* 0] p1
1 [* 0] p2
1 [* 0] c0
1 [* 0] c1
0 [*---] c4
0 [*---] c5
0 [*---] c6
0 [*---] c0
0 [*---] p3
1 [* 1] p4
1 [* 1] p5
1 [* 1] p6
1 [* 1] p0
1 [* 1] c1
0 [*---] c4
0 [*---] c5
0 [*---] c6
0 [*---] c0
0 [*---] p1
1 [* 2] p4
1 [* 2] p5
1 [* 2] p6
1 [* 2] c1
0 [*---] c4
0 [*---] c5
0 [*---] c6
1 [*EOS] c0
1 [*EOS] [main: added end-of-stream marker]
1 [*EOS] c1
0 [*---] c4
0 [*---] c5
0 [*---] c6
Consumer consumption:
C0 -> 3
```

luyan@LAPTOP-III4GAE: ~/chapter30

```
luyan@LAPTOP-III4GAE:~/chapter30$ ./main-two-cvs-while -l 3 -m 1 -p 1 -c 1 -v
NF P0 C0
0 [*] p0
0 [*] c0
0 [*] p1
1 [* 0] p4
1 [* 0] p5
1 [* 0] p6
1 [* 0] c1
1 [* 0] p0
0 [*] c4
0 [*] c5
0 [*] c6
0 [*] p1
1 [* 1] p4
1 [* 1] c0
1 [* 1] p5
1 [* 1] p6
1 [* 1] c1
1 [* 1] p0
0 [*] c4
0 [*] c5
0 [*] c6
0 [*] p1
0 [*] c0
1 [* 2] p4
1 [* 2] p5
1 [* 2] p6
1 [* 2] c1
0 [*] c4
0 [*] c5
0 [*] c6
1 [*EOS] [main: added end-of-stream marker]
1 [*EOS] c0
1 [*EOS] c1
0 [*] c4
0 [*] c5
0 [*] c6
Consumer consumption:
C0 -> 3
```

4.

./main-two-cvs-while -p 1 -c 3 -m 1 -C 0,0,0,1,0,0,0:0,0,0,1,0,0,0:0,0,0,1,0,0,0 -l 10 -v -t

```
Consumer consumption:
C0 -> 0
C1 -> 10
C2 -> 0
Total time: 12.03 seconds
```

5. No.

./main-two-cvs-while -p 1 -c 3 -m 3 -C 0,0,0,1,0,0,0:0,0,0,1,0,0,0:0,0,0,1,0,0,0 -l 10 -v -t

```
Consumer consumption:
C0 -> 0
C1 -> 0
C2 -> 10
Total time: 12.03 seconds
```

6.

```
Consumer consumption:
C0 -> 0
C1 -> 10
C2 -> 0
Total time: 13.03 seconds
```

7. The total time does not change.

```
Consumer consumption:  
C0 -> 0  
C1 -> 10  
C2 -> 0  
  
Total time: 13.03 seconds
```

8. No