

Testy

Założenia

- Przyjąłem że konsument liczb parzystych może pracować tylko jeśli na początku bufora jest liczba parzysta (i analogicznie konsument nieparzysty)
- Przyjąłem, że pełny bufor oznacza wypełniony liczbami od 0 do 29

./main 1 0 0 0 empty

Starting with:

- 1 even producer threads:
- 0 odd producer threads:
- 0 even consumer threads:
- 0 odd consumer threads:

Initial buffer state:

[]

PE [2,]

PE [2, 4,]

PE [2, 4, 6,]

PE [2, 4, 6, 8,]

PE [2, 4, 6, 8, 10,]

PE [2, 4, 6, 8, 10, 12,]

PE [2, 4, 6, 8, 10, 12, 14,]

PE [2, 4, 6, 8, 10, 12, 14, 16,]

PE [2, 4, 6, 8, 10, 12, 14, 16, 18,]

PE [2, 4, 6, 8, 10, 12, 14, 16, 18, 20,]

./main 1 0 0 0 full

Starting with:

- 1 even producer threads:
- 0 odd producer threads:
- 0 even consumer threads:
- 0 odd consumer threads:

Initial buffer state:

[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21,

```
22, 23, 24, 25, 26, 27, 28, 29, ]
```

./main 0 1 0 0 empty

Starting with:

- 0 even producer threads:
- 1 odd producer threads:
- 0 even consumer threads:
- 0 odd consumer threads:

Initial buffer state:

```
[]
```

./main 0 1 0 0 full

Starting with:

- 0 even producer threads:
- 1 odd producer threads:
- 0 even consumer threads:
- 0 odd consumer threads:

Initial buffer state:

```
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, ]
```

./main 0 0 1 0 empty

Starting with:

- 0 even producer threads:
- 0 odd producer threads:
- 1 even consumer threads:
- 0 odd consumer threads:

Initial buffer state:

```
[]
```

./main 0 0 1 0 full

Starting with:

- 0 even producer threads:
- 0 odd producer threads:
- 1 even consumer threads:
- 0 odd consumer threads:

Initial buffer state:

[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29,]

CE [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29,]

./main 0 0 0 1 empty

Starting with:

- 0 even producer threads:
- 0 odd producer threads:
- 0 even consumer threads:
- 1 odd consumer threads:

Initial buffer state:

[]

./main 0 0 0 1 full

Starting with:

- 0 even producer threads:
- 0 odd producer threads:
- 0 even consumer threads:
- 1 odd consumer threads:

Initial buffer state:

[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29,]

./main 1 1 0 0 empty

Starting with:

- 1 even producer threads:
- 1 odd producer threads:

- 0 even consumer threads:

- 0 odd consumer threads:

Initial buffer state:

[]

PE [2,]

PO [2, 3,]

PE [2, 3, 4,]

PO [2, 3, 4, 5,]

PE [2, 3, 4, 5, 6,]

PO [2, 3, 4, 5, 6, 7,]

PE [2, 3, 4, 5, 6, 7, 8,]

PO [2, 3, 4, 5, 6, 7, 8, 9,]

PE [2, 3, 4, 5, 6, 7, 8, 9, 10,]

PO [2, 3, 4, 5, 6, 7, 8, 9, 10, 11,]

PE [2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,]

PO [2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,]

PE [2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14,]

PO [2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15,]

PE [2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16,]

PO [2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17,]

PE [2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18,]

PO [2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19,]

PE [2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20,]

PO [2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21,]

./main 1 1 0 0 full

Starting with:

- 1 even producer threads:

- 1 odd producer threads:

- 0 even consumer threads:

- 0 odd consumer threads:

Initial buffer state:

[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21,
22, 23, 24, 25, 26, 27, 28, 29,]

./main 0 0 1 1 empty

Starting with:

- 0 even producer threads:

```
- 0 odd producer threads:
- 1 even consumer threads:
- 1 odd consumer threads:
Initial buffer state:
[]
```

./main 0 0 1 1 full

Starting with:

```
- 0 even producer threads:
- 0 odd producer threads:
- 1 even consumer threads:
- 1 odd consumer threads:
```

Initial buffer state:

```
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21,
22, 23, 24, 25, 26, 27, 28, 29, ]
CE [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22,
23, 24, 25, 26, 27, 28, 29, ]
CO [2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22,
23, 24, 25, 26, 27, 28, 29, ]
CE [3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23,
24, 25, 26, 27, 28, 29, ]
CO [4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24,
25, 26, 27, 28, 29, ]
CE [5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25,
26, 27, 28, 29, ]
CO [6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25,
26, 27, 28, 29, ]
CE [7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26,
27, 28, 29, ]
CO [8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27,
28, 29, ]
CE [9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28,
29, ]
CO [10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28,
29, ]
CE [11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, ]
CO [12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, ]
CE [13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, ]
CO [14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, ]
CE [15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, ]
```

```
CO [16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, ]
CE [17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, ]
CO [18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, ]
CE [19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, ]
CO [20, 21, 22, 23, 24, 25, 26, 27, 28, 29, ]
CE [21, 22, 23, 24, 25, 26, 27, 28, 29, ]
CO [22, 23, 24, 25, 26, 27, 28, 29, ]
CE [23, 24, 25, 26, 27, 28, 29, ]
CO [24, 25, 26, 27, 28, 29, ]
CE [25, 26, 27, 28, 29, ]
```

./main 1 0 1 0 empty

Starting with:

- 1 even producer threads:
- 0 odd producer threads:
- 1 even consumer threads:
- 0 odd consumer threads:

Initial buffer state:

```
[]
PE [2, ]
PE [2, 4, ]
PE [2, 4, 6, ]
CE [4, 6, ]
PE [4, 6, 8, ]
CE [6, 8, ]
PE [6, 8, 10, ]
CE [8, 10, ]
PE [8, 10, 12, ]
CE [10, 12, ]
PE [10, 12, 14, ]
CE [12, 14, ]
PE [12, 14, 16, ]
CE [14, 16, ]
PE [14, 16, 18, ]
CE [16, 18, ]
PE [16, 18, 20, ]
CE [18, 20, ]
PE [18, 20, 22, ]
CE [20, 22, ]
PE [20, 22, 24, ]
```

```
CE [22, 24, ]
PE [22, 24, 26, ]
CE [24, 26, ]
PE [24, 26, 28, ]
CE [26, 28, ]
PE [26, 28, 30, ]
CE [28, 30, ]
PE [28, 30, 32, ]
CE [30, 32, ]
PE [30, 32, 34, ]
CE [32, 34, ]
PE [32, 34, 36, ]
CE [34, 36, ]
^C
```

./main 1 0 1 0 full

Starting with:

- 1 even producer threads:
- 0 odd producer threads:
- 1 even consumer threads:
- 0 odd consumer threads:

Initial buffer state:

```
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21,
22, 23, 24, 25, 26, 27, 28, 29, ]
```

```
CE [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22,
23, 24, 25, 26, 27, 28, 29, ]
```

./main 0 1 0 1 empty

Starting with:

- 0 even producer threads:
- 1 odd producer threads:
- 0 even consumer threads:
- 1 odd consumer threads:

Initial buffer state:

```
[]
```

./main 0 1 0 1 full

Starting with:

- 0 even producer threads:
- 1 odd producer threads:
- 0 even consumer threads:
- 1 odd consumer threads:

Initial buffer state:

[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29,]

./main 1 1 1 1 empty

Starting with:

- 1 even producer threads:
- 1 odd producer threads:
- 1 even consumer threads:
- 1 odd consumer threads:

Initial buffer state:

[]
PE [2,]
PO [2, 3,]
PE [2, 3, 4,]
CE [3, 4,]
PE [3, 4, 6,]
PO [3, 4, 6, 5,]
PE [3, 4, 6, 5, 8,]
PO [3, 4, 6, 5, 8, 7,]
PE [3, 4, 6, 5, 8, 7, 10,]
CO [4, 6, 5, 8, 7, 10,]
CE [6, 5, 8, 7, 10,]
PO [6, 5, 8, 7, 10, 9,]
PE [6, 5, 8, 7, 10, 9, 12,]
CE [5, 8, 7, 10, 9, 12,]
PE [5, 8, 7, 10, 9, 12, 14,]
PO [5, 8, 7, 10, 9, 12, 14, 11,]
CO [8, 7, 10, 9, 12, 14, 11,]
CE [7, 10, 9, 12, 14, 11,]
PE [7, 10, 9, 12, 14, 11, 16,]
PO [7, 10, 9, 12, 14, 11, 16, 13,]
CO [10, 9, 12, 14, 11, 16, 13,]

CE [9, 12, 14, 11, 16, 13,]
PE [9, 12, 14, 11, 16, 13, 18,]
CO [12, 14, 11, 16, 13, 18,]
PO [12, 14, 11, 16, 13, 18, 15,]
CE [14, 11, 16, 13, 18, 15,]
PE [14, 11, 16, 13, 18, 15, 20,]
PO [14, 11, 16, 13, 18, 15, 20, 17,]
CE [11, 16, 13, 18, 15, 20, 17,]
CO [16, 13, 18, 15, 20, 17,]
PE [16, 13, 18, 15, 20, 17, 22,]
PO [16, 13, 18, 15, 20, 17, 22, 19,]
CE [13, 18, 15, 20, 17, 22, 19,]
CO [18, 15, 20, 17, 22, 19,]
PE [18, 15, 20, 17, 22, 19, 24,]
PO [18, 15, 20, 17, 22, 19, 24, 21,]
CE [15, 20, 17, 22, 19, 24, 21,]
CO [20, 17, 22, 19, 24, 21,]
PE [20, 17, 22, 19, 24, 21, 26,]
PO [20, 17, 22, 19, 24, 21, 26, 23,]
CE [17, 22, 19, 24, 21, 26, 23,]
CO [22, 19, 24, 21, 26, 23,]
PE [22, 19, 24, 21, 26, 23, 28,]
CE [19, 24, 21, 26, 23, 28,]
PE [19, 24, 21, 26, 23, 28, 30,]
PO [19, 24, 21, 26, 23, 28, 30, 25,]
CO [24, 21, 26, 23, 28, 30, 25,]
CE [21, 26, 23, 28, 30, 25,]
PE [21, 26, 23, 28, 30, 25, 32,]
PO [21, 26, 23, 28, 30, 25, 32, 27,]
CO [26, 23, 28, 30, 25, 32, 27,]
CE [23, 28, 30, 25, 32, 27,]
PE [23, 28, 30, 25, 32, 27, 34,]
PO [23, 28, 30, 25, 32, 27, 34, 29,]
CO [28, 30, 25, 32, 27, 34, 29,]
CE [30, 25, 32, 27, 34, 29,]
PE [30, 25, 32, 27, 34, 29, 36,]
PO [30, 25, 32, 27, 34, 29, 36, 31,]
CE [25, 32, 27, 34, 29, 36, 31,]
CO [32, 27, 34, 29, 36, 31,]
PE [32, 27, 34, 29, 36, 31, 38,]
PO [32, 27, 34, 29, 36, 31, 38, 33,]
CE [27, 34, 29, 36, 31, 38, 33,]
CO [34, 29, 36, 31, 38, 33,]

```

PE [34, 29, 36, 31, 38, 33, 40, ]
CE [29, 36, 31, 38, 33, 40, ]
PE [29, 36, 31, 38, 33, 40, 42, ]
PO [29, 36, 31, 38, 33, 40, 42, 35, ]
CO [36, 31, 38, 33, 40, 42, 35, ]
CE [31, 38, 33, 40, 42, 35, ]
PE [31, 38, 33, 40, 42, 35, 44, ]
PO [31, 38, 33, 40, 42, 35, 44, 37, ]
CO [38, 33, 40, 42, 35, 44, 37, ]
CE [33, 40, 42, 35, 44, 37, ]
PE [33, 40, 42, 35, 44, 37, 46, ]
PO [33, 40, 42, 35, 44, 37, 46, 39, ]
CO [40, 42, 35, 44, 37, 46, 39, ]
CE [42, 35, 44, 37, 46, 39, ]
PE [42, 35, 44, 37, 46, 39, 48, ]
PO [42, 35, 44, 37, 46, 39, 48, 41, ]
CE [35, 44, 37, 46, 39, 48, 41, ]
CO [44, 37, 46, 39, 48, 41, ]
PE [44, 37, 46, 39, 48, 41, 0, ]
PO [44, 37, 46, 39, 48, 41, 0, 43, ]
CE [37, 46, 39, 48, 41, 0, 43, ]
CO [46, 39, 48, 41, 0, 43, ]
PE [46, 39, 48, 41, 0, 43, 2, ]
PO [46, 39, 48, 41, 0, 43, 2, 45, ]
CE [39, 48, 41, 0, 43, 2, 45, ]
CO [48, 41, 0, 43, 2, 45, ]
^C

```

./main 1 1 1 1 full

Starting with:

- 1 even producer threads:
- 1 odd producer threads:
- 1 even consumer threads:
- 1 odd consumer threads:

Initial buffer state:

```
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21,
22, 23, 24, 25, 26, 27, 28, 29, ]
```

```
CE [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22,
23, 24, 25, 26, 27, 28, 29, ]
```

```
CO [2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22,
```

23, 24, 25, 26, 27, 28, 29,]
CE [3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29,]
CO [4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29,]
CE [5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29,]
CO [6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29,]
CE [7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29,]
CO [8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29,]
CE [9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29,]
CO [10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29,]
CE [11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29,]
PE [11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 2,]
CO [12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 2,]
PO [12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 2, 3,]
CE [13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 2, 3,]
PE [13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 2, 3, 4,]
CO [14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 2, 3, 4,]
PO [14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 2, 3, 4, 5,]
CE [15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 2, 3, 4, 5,]
CO [16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 2, 3, 4, 5,]
PE [16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 2, 3, 4, 5, 6,]
PO [16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 2, 3, 4, 5, 6, 7,]
CE [17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 2, 3, 4, 5, 6, 7,]
CO [18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 2, 3, 4, 5, 6, 7,]
PE [18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 2, 3, 4, 5, 6, 7, 8,]
PO [18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 2, 3, 4, 5, 6, 7, 8, 9,]
CE [19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 2, 3, 4, 5, 6, 7, 8, 9,]
CO [20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 2, 3, 4, 5, 6, 7, 8, 9,]
PE [20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 2, 3, 4, 5, 6, 7, 8, 9, 10,]
PO [20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11,]
CE [21, 22, 23, 24, 25, 26, 27, 28, 29, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11,]
CO [22, 23, 24, 25, 26, 27, 28, 29, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11,]
PE [22, 23, 24, 25, 26, 27, 28, 29, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,]
PO [22, 23, 24, 25, 26, 27, 28, 29, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,]

[illegible]

[illegible]

```

CO [28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, ]
PO [28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46,
47, ]
CE [29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, ]
PE [29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47,
48, ]
CO [30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, ]
PO [30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48,
49, ]
CE [31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, ]
PE [31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 0,
]
CO [32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 0, ]
PO [32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 0, 1,
]
CE [33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 0, 1, ]
PE [33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 0, 1, 2, ]
CO [34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 0, 1, 2, ]
PO [34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 0, 1, 2, 3, ]
CE [35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 0, 1, 2, 3, ]
CO [36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 0, 1, 2, 3, ]
PE [36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 0, 1, 2, 3, 4, ]
PO [36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 0, 1, 2, 3, 4, 5, ]
CE [37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 0, 1, 2, 3, 4, 5, ]
CO [38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 0, 1, 2, 3, 4, 5, ]
PE [38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 0, 1, 2, 3, 4, 5, 6, ]
PO [38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 0, 1, 2, 3, 4, 5, 6, 7, ]
CE [39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 0, 1, 2, 3, 4, 5, 6, 7, ]
CO [40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 0, 1, 2, 3, 4, 5, 6, 7, ]
PE [40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 0, 1, 2, 3, 4, 5, 6, 7, 8, ]
PO [40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, ]
CE [41, 42, 43, 44, 45, 46, 47, 48, 49, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, ]
CO [42, 43, 44, 45, 46, 47, 48, 49, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, ]
PE [42, 43, 44, 45, 46, 47, 48, 49, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, ]
PO [42, 43, 44, 45, 46, 47, 48, 49, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, ]
^C

```

./main 2 2 2 2 empty

Starting with:

- 2 even producer threads:

- 2 odd producer threads:
- 2 even consumer threads:
- 2 odd consumer threads:

Initial buffer state:

[]

PE [2,]

PE [2, 4,]

PO [2, 4, 3,]

CE [4, 3,]

PE [4, 3, 6,]

PO [4, 3, 6, 5,]

CE [3, 6, 5,]

PE [3, 6, 5, 8,]

PE [3, 6, 5, 8, 10,]

PO [3, 6, 5, 8, 10, 7,]

PE [3, 6, 5, 8, 10, 7, 12,]

PO [3, 6, 5, 8, 10, 7, 12, 9,]

CO [6, 5, 8, 10, 7, 12, 9,]

CE [5, 8, 10, 7, 12, 9,]

PE [5, 8, 10, 7, 12, 9, 14,]

CO [8, 10, 7, 12, 9, 14,]

CE [10, 7, 12, 9, 14,]

PE [10, 7, 12, 9, 14, 16,]

PO [10, 7, 12, 9, 14, 16, 11,]

PO [10, 7, 12, 9, 14, 16, 11, 13,]

CE [7, 12, 9, 14, 16, 11, 13,]

CO [12, 9, 14, 16, 11, 13,]

PE [12, 9, 14, 16, 11, 13, 18,]

CE [9, 14, 16, 11, 13, 18,]

PE [9, 14, 16, 11, 13, 18, 20,]

CO [14, 16, 11, 13, 18, 20,]

PO [14, 16, 11, 13, 18, 20, 15,]

PO [14, 16, 11, 13, 18, 20, 15, 17,]

CE [16, 11, 13, 18, 20, 15, 17,]

PE [16, 11, 13, 18, 20, 15, 17, 22,]

CE [11, 13, 18, 20, 15, 17, 22,]

CO [13, 18, 20, 15, 17, 22,]

PE [13, 18, 20, 15, 17, 22, 24,]

CO [18, 20, 15, 17, 22, 24,]

PO [18, 20, 15, 17, 22, 24, 19,]

PO [18, 20, 15, 17, 22, 24, 19, 21,]

CE [20, 15, 17, 22, 24, 19, 21,]

PE [20, 15, 17, 22, 24, 19, 21, 26,]

CE [15, 17, 22, 24, 19, 21, 26,]
CO [17, 22, 24, 19, 21, 26,]
PE [17, 22, 24, 19, 21, 26, 28,]
PO [17, 22, 24, 19, 21, 26, 28, 23,]
CO [22, 24, 19, 21, 26, 28, 23,]
CE [24, 19, 21, 26, 28, 23,]
PE [24, 19, 21, 26, 28, 23, 30,]
PO [24, 19, 21, 26, 28, 23, 30, 25,]
CE [19, 21, 26, 28, 23, 30, 25,]
CO [21, 26, 28, 23, 30, 25,]
PE [21, 26, 28, 23, 30, 25, 32,]
PO [21, 26, 28, 23, 30, 25, 32, 27,]
CO [26, 28, 23, 30, 25, 32, 27,]
CE [28, 23, 30, 25, 32, 27,]
PE [28, 23, 30, 25, 32, 27, 34,]
PO [28, 23, 30, 25, 32, 27, 34, 29,]
CE [23, 30, 25, 32, 27, 34, 29,]
CO [30, 25, 32, 27, 34, 29,]
PE [30, 25, 32, 27, 34, 29, 36,]
PO [30, 25, 32, 27, 34, 29, 36, 31,]
CE [25, 32, 27, 34, 29, 36, 31,]
CO [32, 27, 34, 29, 36, 31,]
PE [32, 27, 34, 29, 36, 31, 38,]
PO [32, 27, 34, 29, 36, 31, 38, 33,]
CE [27, 34, 29, 36, 31, 38, 33,]
CO [34, 29, 36, 31, 38, 33,]
CE [29, 36, 31, 38, 33,]
PE [29, 36, 31, 38, 33, 40,]
PE [29, 36, 31, 38, 33, 40, 42,]
PO [29, 36, 31, 38, 33, 40, 42, 35,]
CO [36, 31, 38, 33, 40, 42, 35,]
PO [36, 31, 38, 33, 40, 42, 35, 37,]
CE [31, 38, 33, 40, 42, 35, 37,]
CO [38, 33, 40, 42, 35, 37,]
CE [33, 40, 42, 35, 37,]
PE [33, 40, 42, 35, 37, 44,]
PE [33, 40, 42, 35, 37, 44, 46,]
PO [33, 40, 42, 35, 37, 44, 46, 39,]
CO [40, 42, 35, 37, 44, 46, 39,]
PO [40, 42, 35, 37, 44, 46, 39, 41,]
CE [42, 35, 37, 44, 46, 39, 41,]
CE [35, 37, 44, 46, 39, 41,]
PE [35, 37, 44, 46, 39, 41, 48,]


```

CO [37, 44, 46, 39, 41, 48, ]
PE [37, 44, 46, 39, 41, 48, 0, ]
PO [37, 44, 46, 39, 41, 48, 0, 43, ]
CO [44, 46, 39, 41, 48, 0, 43, ]
CE [46, 39, 41, 48, 0, 43, ]
CE [39, 41, 48, 0, 43, ]
PE [39, 41, 48, 0, 43, 2, ]
PE [39, 41, 48, 0, 43, 2, 4, ]
PO [39, 41, 48, 0, 43, 2, 4, 45, ]
CO [41, 48, 0, 43, 2, 4, 45, ]
PO [41, 48, 0, 43, 2, 4, 45, 47, ]
CO [48, 0, 43, 2, 4, 45, 47, ]
CE [0, 43, 2, 4, 45, 47, ]
PE [0, 43, 2, 4, 45, 47, 6, ]
CE [43, 2, 4, 45, 47, 6, ]
^C

```

./main 2 2 2 2 full

Starting with:

- 2 even producer threads:
- 2 odd producer threads:
- 2 even consumer threads:
- 2 odd consumer threads:

Initial buffer state:

```

[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21,
22, 23, 24, 25, 26, 27, 28, 29, ]
CE [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22,
23, 24, 25, 26, 27, 28, 29, ]
CO [2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22,
23, 24, 25, 26, 27, 28, 29, ]
CE [3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23,
24, 25, 26, 27, 28, 29, ]
CO [4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24,
25, 26, 27, 28, 29, ]
CE [5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25,
26, 27, 28, 29, ]
CO [6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25,
26, 27, 28, 29, ]
CE [7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26,
27, 28, 29, ]

```

[illegible]

[illegible]

[illegible]

[illegible]

```
CE [9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, ]
PE [9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28,
]
CO [10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, ]
PO [10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28,
29, ]
CE [11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, ]
PE [11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29,
30, ]
CO [12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, ]
PO [12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30,
31, ]
CE [13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, ]
PE [13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31,
32, ]
CO [14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, ]
PO [14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32,
33, ]
^C
```