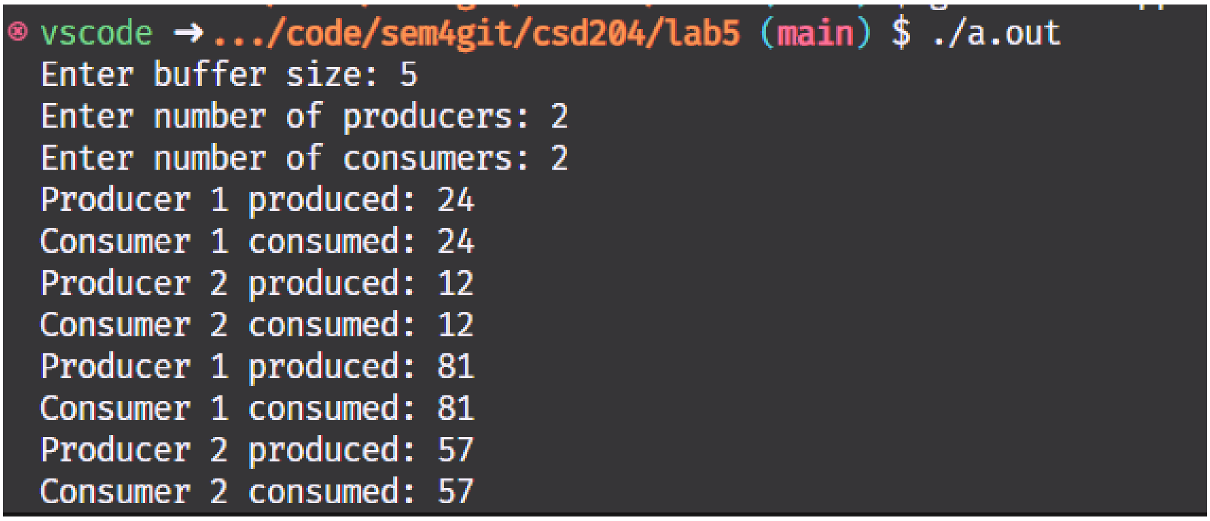
Lab 5 report Shreyas Marwah 2310110604 csd204

q1

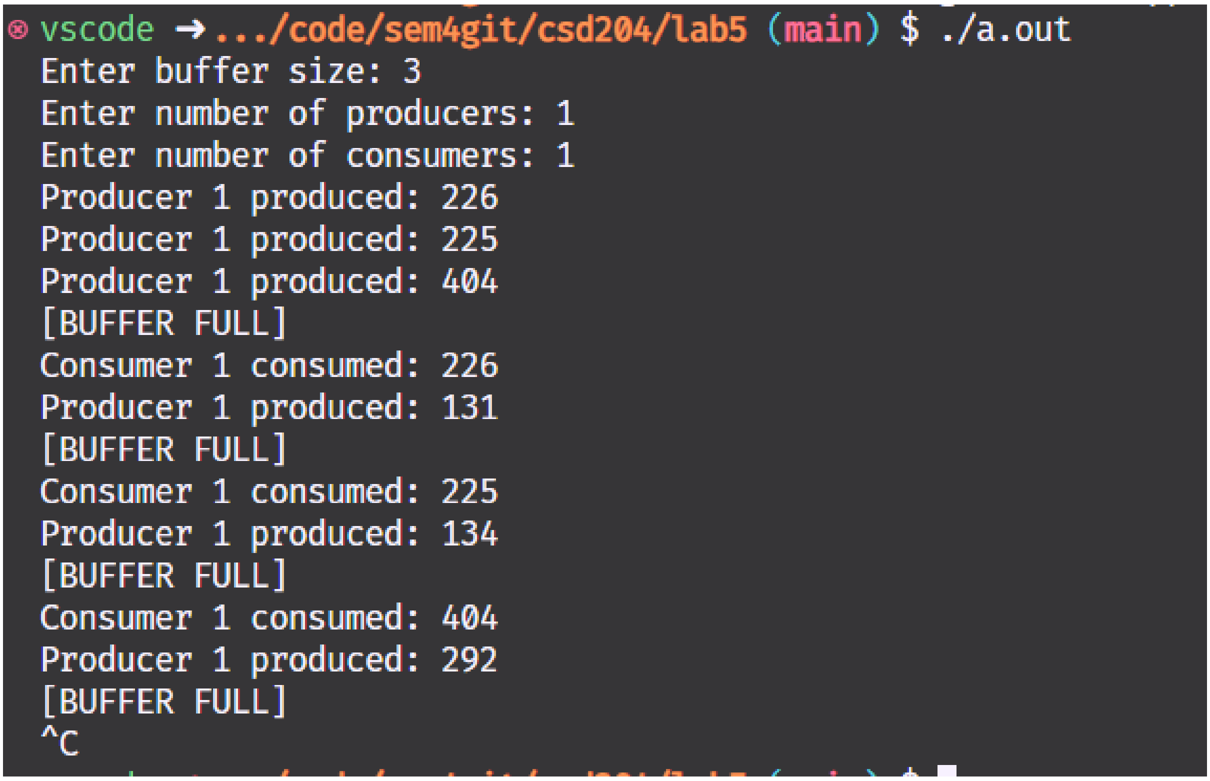
test case 1



```
⊗ vscode ➜ .../code/sem4git/csd204/lab5 (main) $ ./a.out
  Enter buffer size: 5
  Enter number of producers: 2
  Enter number of consumers: 2
  Producer 1 produced: 24
  Consumer 1 consumed: 24
  Producer 2 produced: 12
  Consumer 2 consumed: 12
  Producer 1 produced: 81
  Consumer 1 consumed: 81
  Producer 2 produced: 57
  Consumer 2 consumed: 57
```

in this output we can see that the producers and consumers take turns to produce and consume the data. Consumers do not consume data if the buffer is empty and the producers do not produce data if the buffer is full.

test case 2



```
⊗ vscode ➜ .../code/sem4git/csd204/lab5 (main) $ ./a.out
  Enter buffer size: 3
  Enter number of producers: 1
  Enter number of consumers: 1
  Producer 1 produced: 226
  Producer 1 produced: 225
  Producer 1 produced: 404
  [BUFFER FULL]
  Consumer 1 consumed: 226
  Producer 1 produced: 131
  [BUFFER FULL]
  Consumer 1 consumed: 225
  Producer 1 produced: 134
  [BUFFER FULL]
  Consumer 1 consumed: 404
  Producer 1 produced: 292
  [BUFFER FULL]
  ^C
```

to demonstrate producer blocking. we made the producer much faster than the consumer by changing their respective sleep times to 10ms and 500ms. here we can see that the producer, being much faster than the consumer quickly fills up the buffer and has to wait until the consumer consumes data.

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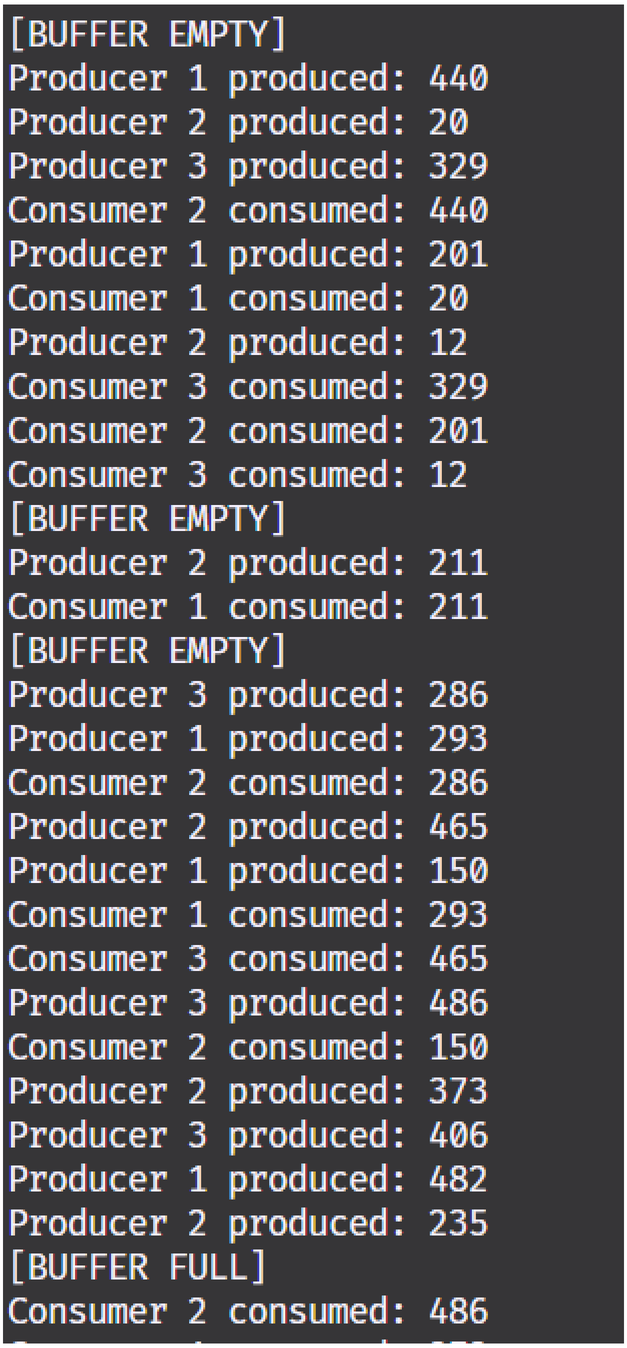
test case 3



```
[BUFFER EMPTY]
Producer 1 produced: 440
Producer 2 produced: 20
Producer 3 produced: 329
Consumer 2 consumed: 440
Producer 1 produced: 201
Consumer 1 consumed: 20
Producer 2 produced: 12
Consumer 3 consumed: 329
Consumer 2 consumed: 201
Consumer 3 consumed: 12
[BUFFER EMPTY]
Producer 2 produced: 211
Consumer 1 consumed: 211
[BUFFER EMPTY]
Producer 3 produced: 286
Producer 1 produced: 293
Consumer 2 consumed: 286
Producer 2 produced: 465
Producer 1 produced: 150
Consumer 1 consumed: 293
Consumer 3 consumed: 465
Producer 3 produced: 486
Consumer 2 consumed: 150
Producer 2 produced: 373
Producer 3 produced: 406
Producer 1 produced: 482
Producer 2 produced: 235
[BUFFER FULL]
Consumer 2 consumed: 486
```

here we can see 3 producers and 3 consumers running concurrently. the buffer reaches an empty state when there is no data inside it, this blocks consumers from consuming. Similarly when the buffer is full, the producers are blocked from consuming the data