Task 1

i)

The output with 5 producers and 0 consumers is:

```
Producer produced: 1534507321, buffer position: 1
Producer produced: 1171885191, buffer position: 0
Producer produced: 93906833, buffer position: 2
Producer produced: 1880913188, buffer position: 3
Producer produced: 1626918669, buffer position: 4
Producer produced: 813268848, buffer position: 0
Producer produced: 1111910226, buffer position: 1
Producer produced: 1174213401, buffer position: 2
Producer produced: 1898119435, buffer position: 3
Producer produced: 1445350030, buffer position: 4
Producer produced: 1080500579, buffer position: 0
Producer produced: 1205686382, buffer position: 1
Producer produced: 867974659, buffer position: 2
Producer produced: 1033013534, buffer position: 3
Producer produced: 481134014, buffer position: 4
Producer produced: 1920510410, buffer position: 0
Producer produced: 728059674, buffer position: 1
Producer produced: 1476770413, buffer position: 2
Producer produced: 2135844037, buffer position: 3
Producer produced: 199523957, buffer position: 4
```

The problem is that the buffer will be overwritten; the producers don't stop producing when the buffer is full!

The output with 0 producers and 5 consumers is:

```
Consumer consumed: 0, buffer position: 0
Consumer consumed: 0, buffer position: 1
Consumer consumed: 0, buffer position: 2
Consumer consumed: 0, buffer position: 3
Consumer consumed: 0, buffer position: 4
Consumer consumed: -1, buffer position: 0
Consumer consumed: -1, buffer position: 1
Consumer consumed: -1, buffer position: 2
Consumer consumed: -1, buffer position: 3
Consumer consumed: -1, buffer position: 4
Consumer consumed: -1, buffer position: 0
Consumer consumed: -1, buffer position: 1
Consumer consumed: -1, buffer position: 2
Consumer consumed: -1, buffer position: 3
```

```
Consumer consumed: -1, buffer position: 4
Consumer consumed: -1, buffer position: 0
Consumer consumed: -1, buffer position: 2
Consumer consumed: -1, buffer position: 1
Consumer consumed: -1, buffer position: 3
Consumer consumed: -1, buffer position: 4
Consumer consumed: -1, buffer position: 0
Consumer consumed: -1, buffer position: 1
Consumer consumed: -1, buffer position: 2
Consumer consumed: -1, buffer position: 3
Consumer consumed: -1, buffer position: 4
Consumer consumed: -1, buffer position: 0
Consumer consumed: -1, buffer position: 1
Consumer consumed: -1, buffer position: 2
```

The problem is that the consumers consumes even if the buffer is empty!

ii)

After editing the code, the output with 5 producers and 0 consumers is:

```
Producer produced: 1277546584, buffer position: 0
Producer produced: 804715142, buffer position: 1
Producer produced: 2113838101, buffer position: 2
Producer produced: 950719586, buffer position: 3
Producer produced: 568877856, buffer position: 4
```

The 5 producers stop producing when the buffer is full, but nothing will ever be consumed...

The output with 0 producers and 5 consumers is "empty" because nobody produces something...

Output with 2 producers and 2 consumers:

```
Producer produced: 1415501505, buffer position: 0
Producer produced: 1722149391, buffer position: 1
Consumer consumed: 1415501505, buffer position: 0
Consumer consumed: 1722149391, buffer position: 1
Producer produced: 1490085254, buffer position: 2
Consumer consumed: 1490085254, buffer position: 2
Producer produced: 1450319603, buffer position: 3
Producer produced: 186830753, buffer position: 4
Consumer consumed: 1450319603, buffer position: 3
Producer produced: 1983687688, buffer position: 0
Producer produced: 1800176350, buffer position: 1
```

```
Consumer consumed: 186830753, buffer position: 4
Consumer consumed: 1983687688, buffer position: 0
Consumer consumed: 1800176350, buffer position: 1
Producer produced: 1886612574, buffer position: 2
```

The producer consumer model is working as it should! Produces until max limit and consumes maximum to finish the buffer elements.