OPERATING SYSTEMS COURSEWORK

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Normal output (Queue Size = 5, Number of Jobs produced per producer = 6, Number of producers = 2, and Number of consumers = 3)

```
jzl18@texel31:os$ make
g++ -Wall -c helper.cc main.cc
g++ -Wall -pthread -o main helper.o main.o
jzl18@texel31:os$ ./main 5 6 2 3
Queue Size = 5, Number of Jobs produced per producer = 6, Number of producers = 2, and Number of consumers = 3
Producer(1): Job id 0 duration 4
Producer(2): Job id 1 duration 8
Consumer(1): Job id 0 executing sleep duration 4
Consumer(3): Job id 1 executing sleep duration 8
Producer(2): Job id 2 duration 4
Consumer(2): Job id 2 executing sleep duration 4
Producer(1): Job id 3 duration 7
Producer(2): Job id 4 duration 10
Consumer(1): Job id 0 completed
Consumer(1): Job id 3 executing sleep duration 7
Producer(2): Job id 0 duration 3
Producer(1): Job id 1 duration 1
Consumer(2): Job id 2 completed
Consumer(2): Job id 4 executing sleep duration 10
Producer(2): Job id 2 duration 4
Consumer(3): Job id 1 completed
Consumer(3): Job id 0 executing sleep duration 3
Producer(2): Job id 3 duration 1
Producer(2): No more jobs to generate.
Producer(1): Job id 4 duration 7
Consumer(1): Job id 3 completed
Consumer(1): Job id 1 executing sleep duration 1
Consumer(3): Job id 0 completed
Consumer(3): Job id 2 executing sleep duration 4
Consumer(1): Job id 1 completed
Consumer(1): Job id 3 executing sleep duration 1
Producer(1): Job id 0 duration 7
Consumer(1): Job id 3 completed
Consumer(1): Job id 4 executing sleep duration 7
Consumer(2): Job id 4 completed
Consumer(2): Job id 0 executing sleep duration 7
Consumer(3): Job id 2 completed
Producer(1): Job id 1 duration 9
Producer(1): No more jobs to generate.
Consumer(3): Job id 1 executing sleep duration 9
Consumer(1): Job id 4 completed
Consumer(2): Job id 0 completed
Consumer(3): Job id 1 completed
Consumer(1): No more jobs left.
Consumer(2): No more jobs left.
Consumer(3): No more jobs left.
jzl18@texel31:os$
```

Edge Case #1: Number of Jobs produced per producer = 0

```
jzl18@texel31:os$ ./main 1 0 2 3
Queue Size = 1, Number of Jobs produced per producer = 0, Number of producers = 2, and Number of consumers = 3
Consumer(1): No more jobs left.
Consumer(2): No more jobs left.
Consumer(3): No more jobs left.
jzl18@texel31:os$
```

Edge Case #2: Number of producers = 0

```
jzl18@texel31:os$ ./main 1 2 0 3
Queue Size = 1, Number of Jobs produced per producer = 2, Number of producers = 0, and Number of consumers = 3
Consumer(2): No more jobs left.
Consumer(1): No more jobs left.
Consumer(3): No more jobs left.
jzl18@texel31:os$
```

Edge Case #3: Need to have correct number of argument line arguments

Edge Case #4: Argument line arguments must only contain positive integers

Edge Case #5: Queue size must be more than 0

Edge Case #6: Number of consumers must be more than 0

```
jzl18@texel31:os$ make
g++ -Wall -c helper.cc main.cc
g++ -Wall -pthread -o main helper.o main.o
jzl18@texel31:os$ ./main 5 6 2
There has to be 4 argument line arguments!
jzl18@texel31:os$ ./main 5 6 2 a
Argument line arguments have to be positive integers!
jzl18@texel31:os$ ./main 5 6 2 -1
Argument line arguments have to be positive integers!
jzl18@texel31:os$ ./main 5 6 2 3.5
Argument line arguments have to be positive integers!
jzl18@texel31:os$ ./main 0 6 2 3
Queue Size must be more than 0!
jzl18@texel31:os$ ./main 1 6 2 0
Number of consumers must be more than 0!
jzl18@texel31:os$
```