# Lab 3 ReadMe

We presented our algorithm with 4 cases to test its effectiveness:

1. Stress Test with Zero Delay:

* In this case, we test our programs performance with no artificial delay.

1. High Consumer to Producer Ratio:

* Test how the program handles more consumers than producers.

1. High Producer to Consumer Ratio:

* Test how program handles more producers than consumers.

1. Single Producer and Consumer:

* Ensure the program can handle a simple one consumer and one producer case.

When our program runs properly, each producer produces the specified number of messages, and each message is consumed by a consumer. An error free execution results in an empty buffer and the following message printed:

*“All producers and consumers have finished.”*.

When the program does not execute properly and the buffer is not empty, this message is printed:

*“ERROR: Buffer not empty”*.

Each of our test cases result in a successful execution message which can be observed below:

1. **Stress test with zero delay:**

Producer 0 produced: Message 0 from Producer 0

Producer 0 produced: Message 1 from Producer 0

Producer 0 produced: Message 2 from Producer 0

Producer 0 produced: Message 3 from Producer 0

Producer 0 produced: Message 4 from Producer 0

Consumer 0 consumed: Message 0 from Producer 0

Producer 1 produced: Message 0 from Producer 1

Consumer 0 consumed: Message 2 from Producer 0

Consumer 0 consumed: Message 0 from Producer 1

Producer 3 produced: Message 0 from Producer 3

Consumer 3 consumed: Message 4 from Producer 0

Consumer 1 consumed: Message 1 from Producer 0

Consumer 1 consumed: Message 0 from Producer 4

Consumer 0 consumed: Message 1 from Producer 1

Producer 4 produced: Message 0 from Producer 4

Producer 2 produced: Message 0 from Producer 2

Consumer 3 consumed: Message 0 from Producer 2

Consumer 2 consumed: Message 3 from Producer 0

Consumer 1 consumed: Message 1 from Producer 3

Producer 1 produced: Message 1 from Producer 1

Producer 2 produced: Message 1 from Producer 2

Consumer 3 consumed: Message 1 from Producer 2

Consumer 3 consumed: Message 2 from Producer 1

Producer 3 produced: Message 1 from Producer 3

Producer 2 produced: Message 2 from Producer 2

Producer 1 produced: Message 2 from Producer 1

Producer 3 produced: Message 2 from Producer 3

Consumer 1 consumed: Message 2 from Producer 3

Consumer 3 consumed: Message 3 from Producer 2

Consumer 2 consumed: Message 2 from Producer 2

Consumer 0 consumed: Message 3 from Producer 1

Consumer 4 consumed: Message 0 from Producer 3

Producer 4 produced: Message 1 from Producer 4

Consumer 1 consumed: Message 3 from Producer 3

Producer 1 produced: Message 3 from Producer 1

Producer 3 produced: Message 3 from Producer 3

Producer 3 produced: Message 4 from Producer 3

Producer 4 produced: Message 2 from Producer 4

Consumer 3 consumed: Message 1 from Producer 4

Consumer 2 consumed: Message 2 from Producer 4

Producer 4 produced: Message 3 from Producer 4

Producer 1 produced: Message 4 from Producer 1

Consumer 4 consumed: Message 4 from Producer 1

Producer 2 produced: Message 3 from Producer 2

Consumer 0 consumed: Message 4 from Producer 3

Consumer 1 consumed: Message 3 from Producer 4

Producer 2 produced: Message 4 from Producer 2

Consumer 2 consumed: Message 4 from Producer 2

Consumer 3 consumed: Message 4 from Producer 4

Producer 4 produced: Message 4 from Producer 4

*All producers and consumers have finished.*

1. **High consumer to producer ratio**

Producer 0 produced: Message 0 from Producer 0

Producer 1 produced: Message 0 from Producer 1

Consumer 0 consumed: Message 0 from Producer 0

Consumer 1 consumed: Message 0 from Producer 1

Producer 0 produced: Message 1 from Producer 0

Consumer 2 consumed: Message 1 from Producer 0

Producer 1 produced: Message 1 from Producer 1

Consumer 3 consumed: Message 1 from Producer 1

Producer 1 produced: Message 2 from Producer 1

Consumer 4 consumed: Message 2 from Producer 1

Producer 0 produced: Message 2 from Producer 0

Consumer 0 consumed: Message 2 from Producer 0

Producer 1 produced: Message 3 from Producer 1

Consumer 1 consumed: Message 3 from Producer 1

Producer 0 produced: Message 3 from Producer 0

Consumer 3 consumed: Message 3 from Producer 0

Producer 1 produced: Message 4 from Producer 1

Consumer 2 consumed: Message 4 from Producer 1

Producer 0 produced: Message 4 from Producer 0

Consumer 4 consumed: Message 4 from Producer 0

*All producers and consumers have finished.*

1. **High producer to consumer ratio:**

Producer 0 produced: Message 0 from Producer 0

Producer 1 produced: Message 0 from Producer 1

Producer 2 produced: Message 0 from Producer 2

Consumer 0 consumed: Message 0 from Producer 0

Producer 3 produced: Message 0 from Producer 3

Consumer 1 consumed: Message 0 from Producer 1

Producer 4 produced: Message 0 from Producer 4

Consumer 1 consumed: Message 0 from Producer 2

Producer 1 produced: Message 1 from Producer 1

Consumer 0 consumed: Message 0 from Producer 3

Producer 0 produced: Message 1 from Producer 0

Consumer 1 consumed: Message 0 from Producer 4

Producer 2 produced: Message 1 from Producer 2

Consumer 0 consumed: Message 1 from Producer 1

Producer 3 produced: Message 1 from Producer 3

Consumer 1 consumed: Message 1 from Producer 0

Producer 4 produced: Message 1 from Producer 4

Consumer 0 consumed: Message 1 from Producer 2

Producer 1 produced: Message 2 from Producer 1

Consumer 1 consumed: Message 1 from Producer 3

Producer 0 produced: Message 2 from Producer 0

Consumer 0 consumed: Message 1 from Producer 4

Producer 2 produced: Message 2 from Producer 2

Consumer 1 consumed: Message 2 from Producer 1

Producer 3 produced: Message 2 from Producer 3

Consumer 0 consumed: Message 2 from Producer 0

Producer 4 produced: Message 2 from Producer 4

Consumer 1 consumed: Message 2 from Producer 2

Producer 1 produced: Message 3 from Producer 1

Consumer 0 consumed: Message 2 from Producer 3

Producer 0 produced: Message 3 from Producer 0

Consumer 1 consumed: Message 2 from Producer 4

Producer 2 produced: Message 3 from Producer 2

Consumer 0 consumed: Message 3 from Producer 1

Producer 3 produced: Message 3 from Producer 3

Consumer 1 consumed: Message 3 from Producer 0

Producer 4 produced: Message 3 from Producer 4

Consumer 0 consumed: Message 3 from Producer 2

Producer 1 produced: Message 4 from Producer 1

Consumer 1 consumed: Message 3 from Producer 3

Consumer 0 consumed: Message 3 from Producer 4

Producer 2 produced: Message 4 from Producer 2

Producer 0 produced: Message 4 from Producer 0

Consumer 1 consumed: Message 4 from Producer 1

Consumer 0 consumed: Message 4 from Producer 2

Producer 3 produced: Message 4 from Producer 3

Producer 4 produced: Message 4 from Producer 4

Consumer 1 consumed: Message 4 from Producer 0

Consumer 0 consumed: Message 4 from Producer 3

Consumer 0 consumed: Message 4 from Producer 4

*All producers and consumers have finished.*

1. **Single producer and consumer:**

Producer 0 produced: Message 0 from Producer 0

Consumer 0 consumed: Message 0 from Producer 0

Producer 0 produced: Message 1 from Producer 0

Consumer 0 consumed: Message 1 from Producer 0

Producer 0 produced: Message 2 from Producer 0

Consumer 0 consumed: Message 2 from Producer 0

Producer 0 produced: Message 3 from Producer 0

Consumer 0 consumed: Message 3 from Producer 0

Producer 0 produced: Message 4 from Producer 0

Consumer 0 consumed: Message 4 from Producer 0

*All producers and consumers have finished.*