**CLC Assignment 1: Producer and Consumer**

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CST-315: Operating Systems Lecture and Lab

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**Contributors:**

Code: Atu Ambala, Ricardo Escarcega

Documentation/README: Ricardo Escarcega, Atu Ambala

**Approach:**

Our solution tackles the classic Producer-Consumer problem by employing threads in C and implementing synchronization through mutex locks. The program features two threads: a producer thread responsible for generating items and placing them into a shared buffer, and a consumer thread tasked with retrieving and processing these items. Synchronization is achieved by utilizing mutex locks to ensure exclusive access to the shared buffer, preventing race conditions. Key functionalities include the **produce** and **put** functions for the producer, and the **get** and **consume** functions for the consumer. Thread management is handled through **pthread\_create** and **pthread\_join**, ensuring proper execution and termination of threads. The program simulates real-world scenarios by incorporating **sleep** to simulate production and consumption times, maintaining a balanced flow of item processing. Additionally, considerations for performance and scalability are discussed, highlighting potential optimizations and extensibility for accommodating larger workloads or additional features.

**Flowchart**

A diagram of a product

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**Code**

https://github.com/AtuAmbala/CST-315/tree/main/Assignment%201%3A%20Producer%20and%20ConsumerA screenshot of a computer program

Description automatically generatedA computer screen shot of text

Description automatically generatedA computer screen shot of a program code

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**Execution:** A screenshot of a computer

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A screenshot of a computer

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**Testing and Validation**

Our code implemented the required tasks on the first run meaning we didn’t have to amek any tweaks to our project.