**Assignment 1: Producer and Consumer**

Asher Shores, Philip Varkey

College of Science, Engineering, and Technology, Grand Canyon University

CST-315: Operating Systems Lecture & Lab

Dr. Ricardo Citro

23 January 2022

**Activity Directions:**

In this project students will design, implement, and evaluate a computing-based solution to meet a given set of computing requirements. Students will demonstrate the ability to create and manage processes and threads. They will create two processes, *Producer* and *Consumer*, using the C functions below:

Text

Description automatically generatedGraphical user interface, text, application, email

Description automatically generated

**Approach for Implementation:**

The Producer-consumer problem is a classic in computer science. There are two processes that must be repeated cyclically. The main restriction is this assignment is that the use of semaphores is prohibited. As such our code makes use of counters and mutual exclusion to create workflow between functions and have consumer wait until work is available and producer wait until buffer has space available. This process can be generalized using special mutexes called semaphores (which as stated cannot be used). To avoid locking our process through a purgatory state where producer is not producing and consumer has no available work, we will balance the two functions to alternate the production and subsequent consumption.

Diagram

Description automatically generated

**Code Execution:Text

Description automatically generated**

**GitHub Link:**

[**https://github.com/asherShores5/Producer-and-Consumer-Problem/tree/main**](https://github.com/asherShores5/Producer-and-Consumer-Problem/tree/main)

**Deliverables:**

1. Information about you (name, course, assignment name, date)

*Included in title page and on README.md*

1. An explanation of your approach to implementation and its reasoning

*Included above, with flowchart of expected program flow*

1. Program execution results:
   1. All the source code files (upload to your ~~BitBucket~~ GitHub repository and to LoudCloud) - <https://github.com/asherShores5/Producer-and-Consumer-Problem/tree/main>
   2. Comment header in the code, describing the solution and identifying the programmer
   3. Screenshots showing successful and correct execution of the code
2. Package all of the above into one zipped folder and upload it to LoudCloud.
3. Add a link to your ~~BitBucket~~ GitHub Server repository.