CECS 326-01

Operating Systems

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Assignment 5

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Program Description

1. Unity
    a. This program demonstrates inter-process communication using shared memory and semaphores. The system includes three components: master.c, slave.c, and myShm.h, which together facilitate synchronized data sharing and logging among multiple processes.

2. What each program does individually.
    a. master.c
        i. The master program initializes the shared memory and defines the structure to store process data. It creates and manages semaphores to ensure safe access to shared resources. The program spawns multiple child processes, waits for their completion, and displays the final contents of the shared memory. Afterward, it cleans up semaphores and shared memory, ensuring proper resource deallocation.
    b. slave.c
        i. Each child process runs the slave program, which connects to the shared memory created by the master. It uses semaphores to safely write its process ID to the shared memory and to synchronize its terminal output. Additionally, each slave creates a unique log file documenting its activity. Once its tasks are complete, the slave cleans up its resources and exits.

c. myShm.h
    i. This header file defines the shared memory structure, CLASS, which includes an integer index for tracking the current slot and an array report to store data from child processes. The header ensures a consistent memory structure for communication between the master and slaves.