CSC 33200 (L) - Operating Systems – Spring 2022

Lab 5: Process Synchronization
Date: 04/08/2022

DUE: 05/05/2022

The given **bank.c** program has 3 processes namely, the dad process and two son processes where a son withdrawing money from the bank and the dad depositing money in the bank, at randomly selected time intervals. The program in the given form has synchronization errors and logical errors. The program itself compiles correctly.

In the bank there are also 2 atm machines. Meaning at a time there are only 2 processes that can request to view the balance or can withdraw or deposit money.

Task1:

Identify the critical section and synchronize the program. You would need to use P(sem) and V(sem) operations at the right places to solve the synchronization problem. You will also need to find the logical flaw if there is any and try to solve it. To use P(sem) and V(sem) include the provided "sem.h" file. Your solution should solve the following problems:

- Prevent race conditions
- Prevent a son from withdrawing money when there is no balance.
- Prevent undefined outputs like negative balance
- Prevent a process from continuously requesting access to the shared memory. Prevent unnecessary cpu cycle.
- The problem should be solved with as few semaphore variables as possible.

Marks: 30

Task2:

Submit a report showing the critical section of the code (and logical errors) and explain your solution in detail.

Marks: 10