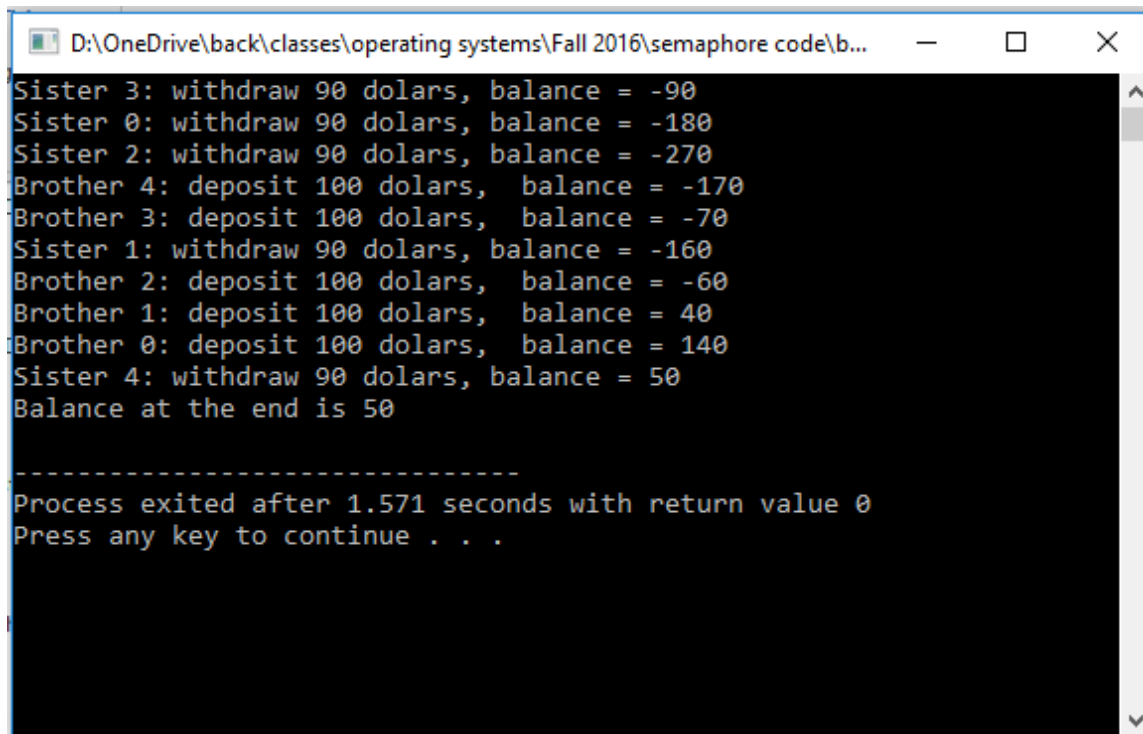


OPERATING SYSTEMS – COMP 3318 – FALL 2016

Homework #4

Due on December 04, 11:59pm

- 1) Michael has 5 brothers and 5 sisters. They all share the same account and they all have a copy of the debit card so that all of them can use ATM to deposit or withdraw money. One day Michael drives all his siblings to a bank with a van which has n number of ATMs. Michaels brothers will deposit \$100 and his sisters will withdraw \$90. They all insert their card start their transaction.
- A) As a programmer fix the attached code to prevent the race condition, using semaphores (Hint: you just need to wrap critical region by using two semaphore operations appropriately `sem_wait(&account);` and `sem_post(&account);`. Don't make any changes in any other part of the code just add wait (P) and post(V) operations) So that balance at the end is always \$50 as supposed to be) Save it as prog1.c. upload to moodle



```
D:\OneDrive\back\classes\operating systems\Fall 2016\semaphore code\b...
Sister 3: withdraw 90 dollars, balance = -90
Sister 0: withdraw 90 dollars, balance = -180
Sister 2: withdraw 90 dollars, balance = -270
Brother 4: deposit 100 dollars, balance = -170
Brother 3: deposit 100 dollars, balance = -70
Sister 1: withdraw 90 dollars, balance = -160
Brother 2: deposit 100 dollars, balance = -60
Brother 1: deposit 100 dollars, balance = 40
Brother 0: deposit 100 dollars, balance = 140
Sister 4: withdraw 90 dollars, balance = 50
Balance at the end is 50

-----
Process exited after 1.571 seconds with return value 0
Press any key to continue . . .
```

- B) You also need to add an overdraft protection to the code, so if the balance is not enough sisters must wait. Save it as prog2.c. upload to moodle.