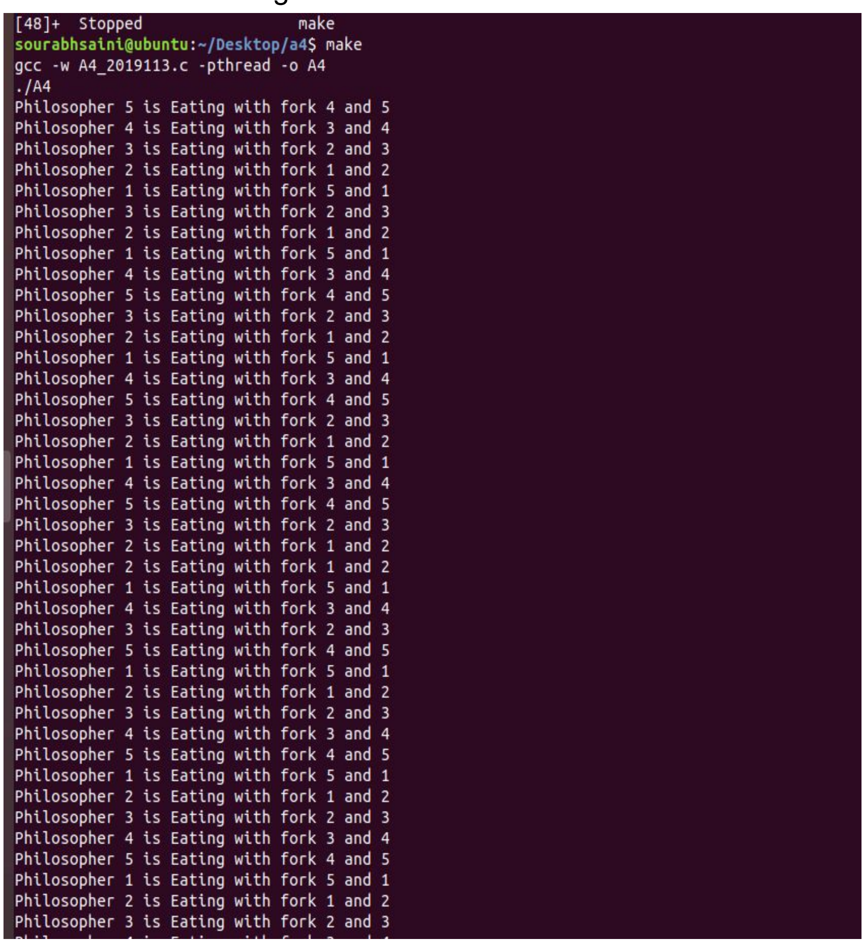
Note: I also commented code detailed explanation of code is in the code file.
Creating Semaphore:
In this assignment I have used a pthread library to create a counting semaphore. First I created a struct for semaphore that I stored. Value of semaphore, pthread_mutex, pthread_cond_t .
Using this struct I created a wait and signal functionality of semaphore.
Wait for Semaphore: In this function, I first locked this function using pthread_mutex _lock() so that no other thread could access it, then if I checked the value of counting semaphore if it is less than 0 then I sent a wait signal.

Signal of Semaphore: Again in this first locked this function then signal the the process using
pthread_cond_signal(&(s->wait));

Philosopher Problem:
To solve this problem I first create k+3 semaphores (k is no of philosophers) then using these semaphores I first give a fork to the philosopher then I give a bowl of sauce to the philosopher. And then release the sauce and then fork. As by doing this we never got into race condition because by using sauce only one philosopher can eat at a time and when one completes it releases everything it holds.
Screenshot of working code:



```
[48]+  Stopped                 make
sourabhsaini@ubuntu:~/Desktop/a4$ make
gcc -w A4_2019113.c -pthread -o A4
./A4
Philosopher 5 is Eating with fork 4 and 5
Philosopher 4 is Eating with fork 3 and 4
Philosopher 3 is Eating with fork 2 and 3
Philosopher 2 is Eating with fork 1 and 2
Philosopher 1 is Eating with fork 5 and 1
Philosopher 3 is Eating with fork 2 and 3
Philosopher 2 is Eating with fork 1 and 2
Philosopher 1 is Eating with fork 5 and 1
Philosopher 4 is Eating with fork 3 and 4
Philosopher 5 is Eating with fork 4 and 5
Philosopher 3 is Eating with fork 2 and 3
Philosopher 2 is Eating with fork 1 and 2
Philosopher 1 is Eating with fork 5 and 1
Philosopher 4 is Eating with fork 3 and 4
Philosopher 5 is Eating with fork 4 and 5
Philosopher 3 is Eating with fork 2 and 3
Philosopher 2 is Eating with fork 1 and 2
Philosopher 1 is Eating with fork 5 and 1
Philosopher 4 is Eating with fork 3 and 4
Philosopher 5 is Eating with fork 4 and 5
Philosopher 3 is Eating with fork 2 and 3
Philosopher 2 is Eating with fork 1 and 2
Philosopher 2 is Eating with fork 1 and 2
Philosopher 1 is Eating with fork 5 and 1
Philosopher 4 is Eating with fork 3 and 4
Philosopher 3 is Eating with fork 2 and 3
Philosopher 5 is Eating with fork 4 and 5
Philosopher 1 is Eating with fork 5 and 1
Philosopher 2 is Eating with fork 1 and 2
Philosopher 3 is Eating with fork 2 and 3
Philosopher 4 is Eating with fork 3 and 4
Philosopher 5 is Eating with fork 4 and 5
Philosopher 1 is Eating with fork 5 and 1
Philosopher 2 is Eating with fork 1 and 2
Philosopher 3 is Eating with fork 2 and 3
Philosopher 4 is Eating with fork 3 and 4
Philosopher 5 is Eating with fork 4 and 5
Philosopher 1 is Eating with fork 5 and 1
Philosopher 2 is Eating with fork 1 and 2
Philosopher 3 is Eating with fork 2 and 3
```