EXERCISE 4

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#include <stdio.h>
#include <pthread.h>
#include <semaphore.h>
#include <unistd.h>
#define N 5
sem_t forks[N];
pthread_t philosophers[N];
void* philosopher(void* num) {
 int id = *(int*)num;
 printf("Philosopher %d is thinking\n", id);
 sleep(1);
 sem_wait(&forks[id]);
 sem_wait(&forks[(id + 1) % N]);
 printf("Philosopher %d is eating\n", id);
 sleep(1);
 sem_post(&forks[id]);
 sem_post(&forks[(id + 1) % N]);
 printf("Philosopher %d finished eating\n", id);
 return NULL;
}
int main() {
 int i, id[N];

 for (i = 0; i < N; i++)
 sem_init(&forks[i], 0, 1);
 for (i = 0; i < N; i++) {
 id[i] = i;
 pthread_create(&philosophers[i], NULL, philosopher, &id[i]);
 }
 for (i = 0; i < N; i++)
 pthread_join(philosophers[i], NULL);
 return 0;
}
```