BÁO CÁO THỰC HÀNH

Buổi 7

Môn:	Nhập môn Hệ điều hành
Nhóm:	N3T01
Họ và tên:	Lưu Hữu Trí
MSSV:	52200167
Số bài hoàn thành:	3/4 (75%)

Câu 1:

```c
#include <stdio.h>
#include <pthread.h>
#include <semaphore.h>
#include <unistd.h>

sem_t mutex1, mutex2;

void* in_le(void* arg) {
        int i;
        for (i = 1; i <= 11; i = i + 2)
        {
                sem_wait(&mutex2);
                printf("%d\n", i);
                sem_post(&mutex1);
        }
}

void* in_chan(void* arg) {
        int i;
        for (i = 2; i <= 10; i = i + 2)
        {
                sem_wait(&mutex1);
                printf("%d\n", i);
                sem_post(&mutex2);
        }
}

int main(int argv, char ** agrv) {
        sem_init(&mutex1, 0, 0);
        sem_init(&mutex2, 0, 1);
        pthread_t t1, t2;

        pthread_create(&t1, NULL, in_le, NULL);
        pthread_create(&t2, NULL, in_chan, NULL);

        pthread_join(t1, NULL);
        pthread_join(t2, NULL);


        return 0;
}
```

Terminal:

```
root@ubuntu: /home/lab7
root@ubuntu:/home/lab7# gcc -c bai1.c
root@ubuntu:/home/lab7# gcc -o bai1.out bai1.o -lpthread
root@ubuntu:/home/lab7# ./bai1.out
1
2
3
4
5
6
7
8
9
10
11
root@ubuntu:/home/lab7#
```

Câu 2:

```c
#include <semaphore.h>
#include <pthread.h>
#include <stdlib.h>
#include <math.h>
#include <string.h>
#include <stdio.h>
#include <unistd.h>

#define SEED 345234512

sem_t sem;
int niter, thread_num, point = 0;

void* calculatePI() {
        srand(SEED);
        int i, count = 0;
        double x, y, z;
        int new_niter = niter / thread_num;

        for (i = 0; i < new_niter; i++)
        {
                x = (double)rand()/RAND_MAX;
                y = (double)rand()/RAND_MAX;
                z = x*x + y*y;

                if (z <= 1) count++;
        }
        sem_wait(&sem);
        point += count;
        sem_post(&sem);
        pthread_exit(NULL);

}
int main(int argc, char ** argv) {
        int i;
        printf("Enter the number of interations used to estimate pi:
");
        scanf("%d", &niter);
        printf("Enter number of thread: ");
        scanf("%d", &thread_num);
        pthread_t threads[thread_num];
        sem_init(&sem, 0, 1);

        for (i = 0; i < thread_num; i ++) {
                pthread_create(&threads[i], NULL, calculatePI, NULL);
        }

        for (i = 0; i < thread_num; i++) {
                pthread_join(threads[i], NULL);
        }

        double pi = (double)point/niter*4;
        printf("# of trials = %d, estimate of pi is %g\n", niter,
pi);
        sem_destroy(&sem);

        return 0;
}
```

Terminal:

```
root@ubuntu: /home/lab7
root@ubuntu:/home/lab7# gcc -c bai1.c
root@ubuntu:/home/lab7# gcc -o bai2.out bai2.o -lpthread
root@ubuntu:/home/lab7# ./bai2.out
Enter the number of interations used to estimate pi: 100000000
Enter number of thread: 3
# of trials = 100000000, estimate of pi is 3.14166
root@ubuntu:/home/lab7#
```

Câu 3:

```c
#include<stdio.h>
#include<pthread.h>
#include<semaphore.h>
#include<unistd.h>
#include<stdlib.h>
sem_t slep, slep1, slep2;
void* SXKhung(){
        sem_wait(&slep);
        printf("San xuat khung\n");
        sleep(2);
        sem_post(&slep1);
}

void* SXBanhXe(){
        int i;
        sem_wait(&slep1);
        for(i = 0; i < 4; i++){
                printf("San xuat banh xe\n");
                sleep(2);
        }
        sem_post(&slep2);
}

void* LapRapXe(void *a){
        sem_wait(&slep2);
        printf("Lap rap xe thu %d\n", (int)a + 1);
        sleep(2);
        sem_post(&slep);
}

int main(){
        sem_init(&slep, 0, 1);
        sem_init(&slep1, 0, 0);
        sem_init(&slep2, 0, 0);
        int a, i, num;
        printf("Nhap so xe can san xuat: ");
        scanf("%d", &a);
        pthread_t thread[3];
```

```
39      for(i = 0; i < a; i++){
40          pthread_create(&thread[0], NULL, SXKhung, NULL);
41          pthread_create(&thread[1], NULL, SXBanhXe, NULL);
42          pthread_create(&thread[2], NULL, LapRapXe, (int*)i);
43      }
44      for(i = 0; i < 3; i++){
45          pthread_join(thread[i], NULL);
46      }
47
48
49      sem_destroy(&slep);
50      sem_destroy(&slep1);
51      sem_destroy(&slep2);
52  }
```

Terminal:

```
root@ubuntu: /home/lab7
root@ubuntu:/home/lab7# gcc -c bai3.c
root@ubuntu:/home/lab7# gcc -o bai3.out bai3.o -lpthread
root@ubuntu:/home/lab7# ./bai3.out
Nhap so xe can san xuat: 2
San xuat khung
San xuat banh xe
San xuat banh xe
San xuat banh xe
San xuat banh xe
Lap rap xe thu 1
San xuat khung
San xuat banh xe
San xuat banh xe
San xuat banh xe
San xuat banh xe
Lap rap xe thu 2
root@ubuntu:/home/lab7#
```