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Bài 1:

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

#define MAX_THREAD 2

pthread_t tid[MAX_THREAD]={0};
/*Counter la bien toan cuc duoc 2 thread su dung*/
int counter;
pthread_mutex_t mutex = PTHREAD_MUTEX_INITIALIZER;
//khai bao mutex
long int total_point;
long int count_circle = 0;

void *threadFunc(void *param)
```

```
{
    pthread_mutex_lock(&mutex);
    int *pcount = (int *)param;
    int i;
    for (i = 0; i < total_point; i++)
    {
        double x = (double)rand() / (double)RAND_MAX;
        double y = (double)rand() / (double)RAND_MAX;
        double r = x * x + y * y;
        if (r <= 1)
            *pcount = *pcount + 1;
    }
    pthread_mutex_unlock(&mutex);
    pthread_exit(NULL);
}

int main(int argc, char const *argv[])
{
    srand(time(NULL));
    total_point = atoll(argv[1]) / MAX_THREAD;
    int i = 0;
    int ret = 0;
```

```
    int cnt[2]={0};
    for (i = 0; i < MAX_THREAD; i++)
    {
        ret = pthread_create(&(tid[i]), NULL, threadFunc,&cnt[i]);
        if (ret != 0)
        {
            printf("Thread [%d] created error\n", i);
        }
    }

    for (i = 0; i < MAX_THREAD; i++)
    {
        pthread_join(tid[i], NULL);
        count_circle += cnt[i];
    }
    double pi = 4.0 * (double)count_circle / (double)total_point /
(double)MAX_THREAD;
    printf("PI = %f\n", pi);
    return 0;
}
```

```
trongdat1108@ubuntu:~/tuan 9$ gcc -c  bai1.c
trongdat1108@ubuntu:~/tuan 9$ gcc -o bai1.out bai1.o -lpthread
trongdat1108@ubuntu:~/tuan 9$ ./bai1.out 2000000
PI = 3.141876
trongdat1108@ubuntu:~/tuan 9$
```

Bài 2:

```
#include <pthread.h>
#include <stdio.h>
#include <stdlib.h>
#include <sys/types.h>
#include <unistd.h>
pthread_mutex_t a_mutex; // dong bo
static int sove = 0;
void *thr1()
{
   FILE *out = fopen("sove.txt", "r");
   fscanf(out, "%d", &sove);
   fclose(out);
}
void *thr2()
{
   pthread_mutex_lock(&a_mutex);
   if (sove == 0)
   {
      printf("Da het ve,khong the mua tiep\n");
   }
   int tmp;
   FILE *out = fopen("daily1.txt", "r");
   while (fscanf(out, "%d", &tmp)!=EOF)
   {
      if (tmp < sove)
```

```
        {
            printf("Dat mua thanh cong dai li 1 voi so ve %d\n", tmp);
            sove -= tmp;
        }
        else
        {
            printf("Khong dat mua thanh cong dai li 1 voi so ve %d\n",
tmp);
        }
    }
    fclose(out);
    sleep(5);
    pthread_mutex_unlock(&a_mutex);
    pthread_exit(NULL);
}
void *thr3()
{
    pthread_mutex_lock(&a_mutex);
    int tmp;
    FILE *out = fopen("daily2.txt", "r");
    if (sove == 0)
    {
        printf("Da het ve,khong the mua tiep\n");
    }
    while (fscanf(out, "%d", &tmp)!=EOF)
    {
        if (tmp < sove)
        {
            printf("Dat mua thanh cong dai li 2 voi so ve %d\n", tmp);
            sove -= tmp;
        }
        else
        {
```

```
            printf("Khong dat mua thanh cong dai li 2 voi so ve %d\n",
tmp);
        }
    }
    fclose(out);
    sleep(5);

    pthread_mutex_unlock(&a_mutex);
    pthread_exit(NULL);
}
int main()
{
    int res = pthread_mutex_init(&a_mutex, NULL);
    // a_mutex = PTHREAD_MUTEX_INITIALIZER;
    int i;
    pthread_t tid[3];
    int status, *pstatus = &status;
    pthread_create(&tid[0], NULL, thr1, NULL);
    if (pthread_join(tid[0], (void **)pstatus) == 0)
    {
        pthread_create(&tid[1], NULL, thr2, NULL);
        pthread_join(tid[1], (void **)pstatus);
        sleep(5);
        pthread_create(&tid[2], NULL, thr3, NULL);
        pthread_join(tid[2], (void **)pstatus);
    }

    return 0;
}
```

```
trongdat1108@ubuntu:~/tuan 9$ gcc -c bai2.c
trongdat1108@ubuntu:~/tuan 9$ gcc -o bai2.out bai2.o -lpthread
trongdat1108@ubuntu:~/tuan 9$ ./bai2.out
Dat mua thanh cong dai li 1 voi so ve 2
Dat mua thanh cong dai li 1 voi so ve 4
Dat mua thanh cong dai li 1 voi so ve 5
Dat mua thanh cong dai li 1 voi so ve 10
Dat mua thanh cong dai li 2 voi so ve 5
Dat mua thanh cong dai li 2 voi so ve 3
Dat mua thanh cong dai li 2 voi so ve 4
trongdat1108@ubuntu:~/tuan 9$
```