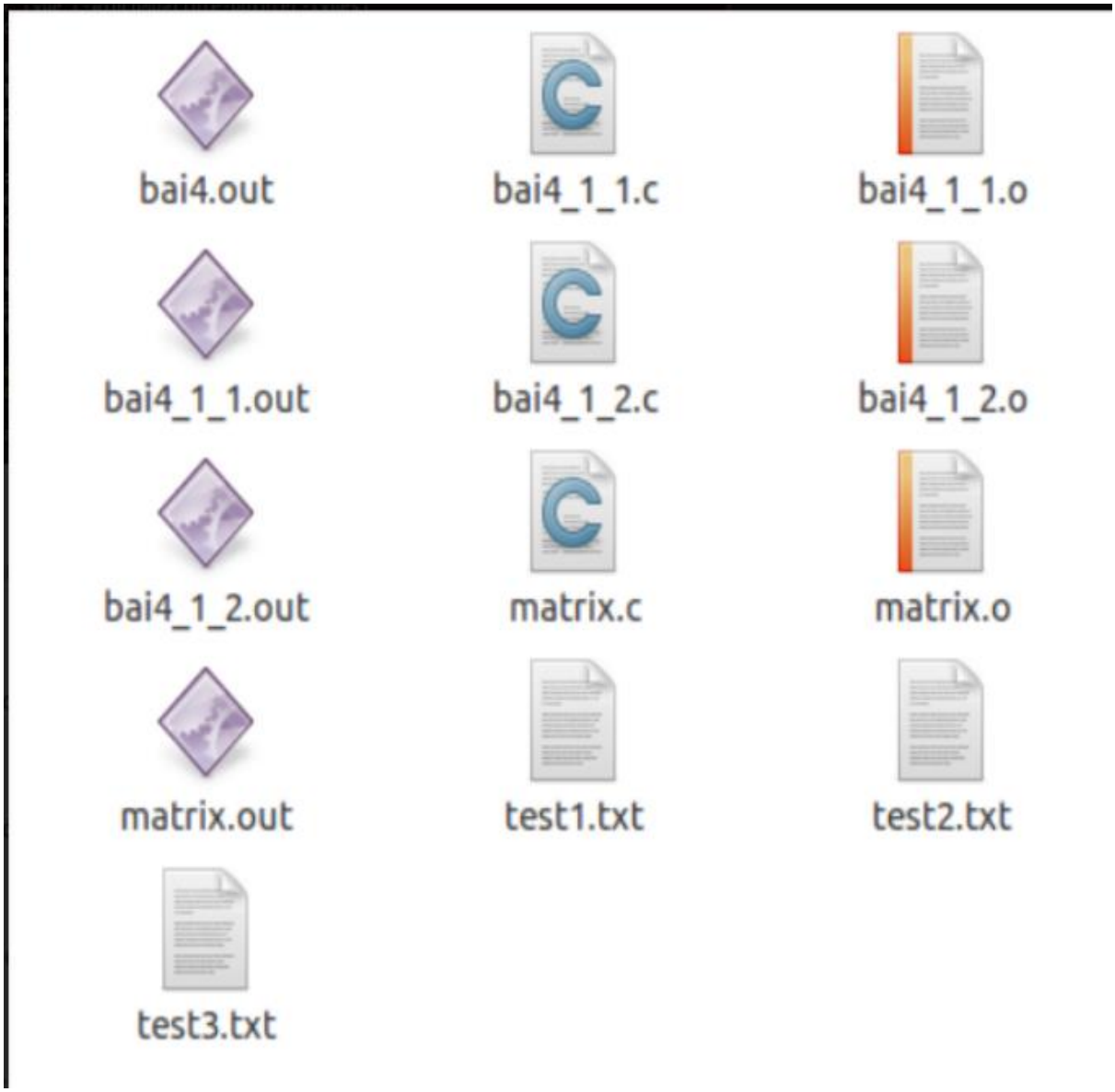
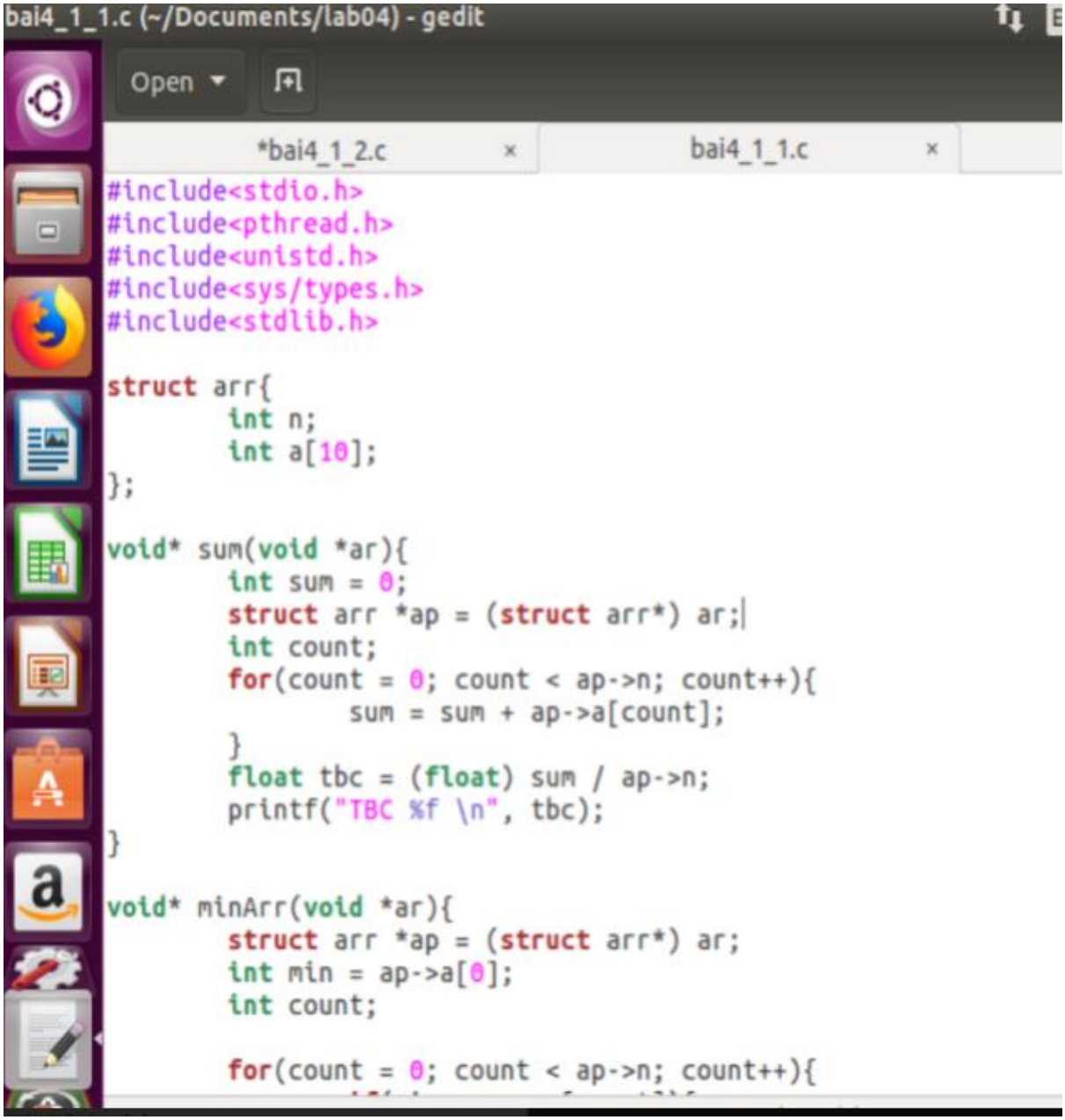
Tên: Nguyễn Tấn Thành

MSSV: 52100841

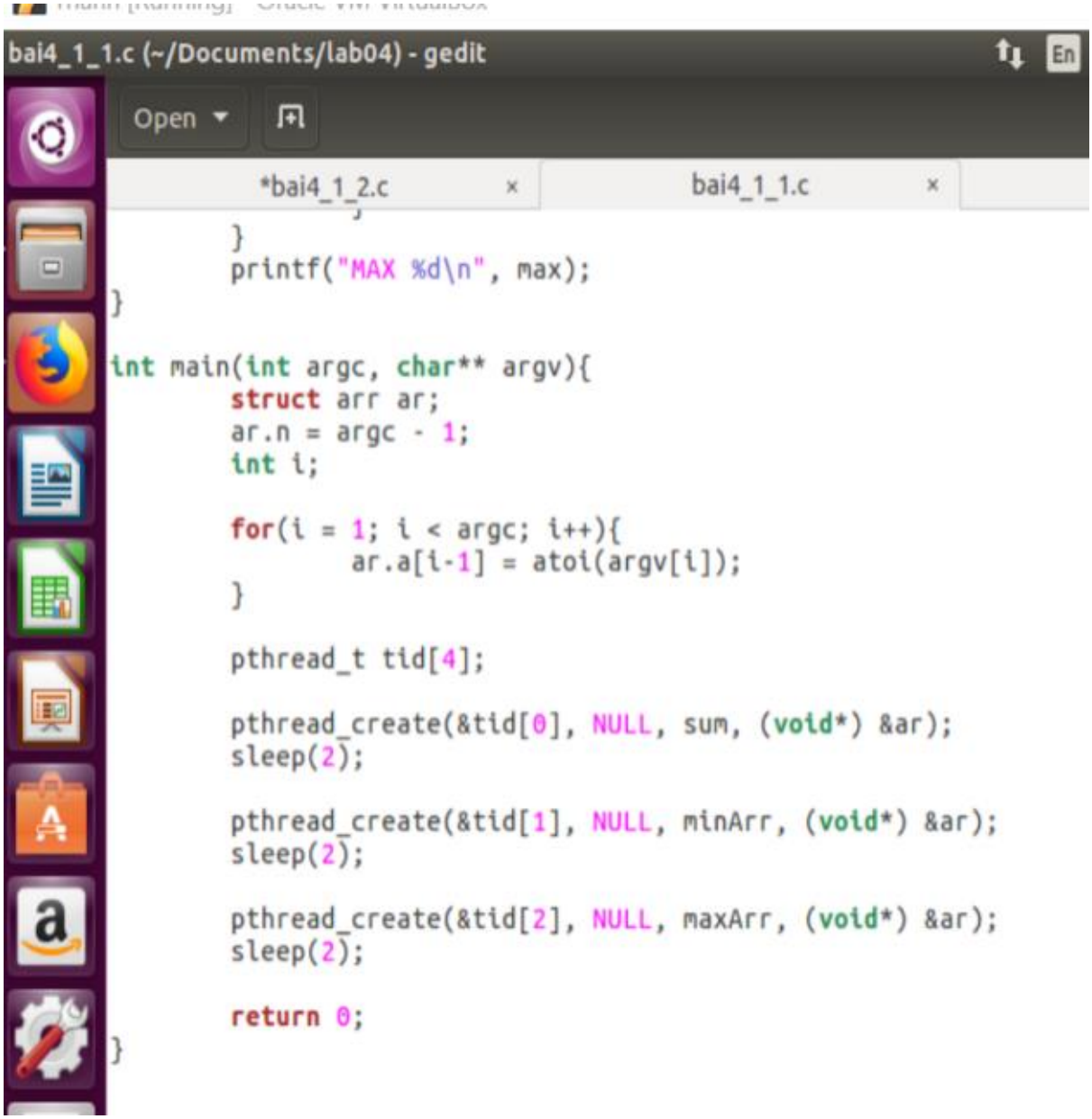


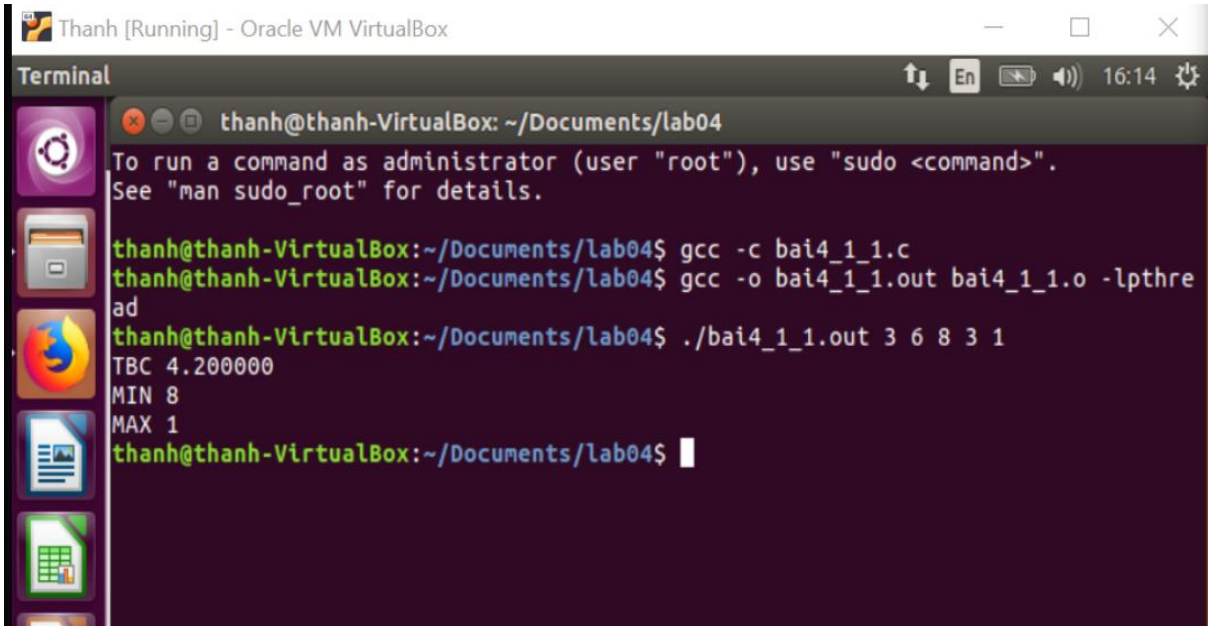
Lab4.1:

Bài 01:


bai4_1_1.c (~/Documents/lab04) - gedit
Open
*bai4_1_2.c
bai4_1_1.c
#include<stdio.h>
#include<pthread.h>
#include<unistd.h>
#include<sys/types.h>
#include<stdlib.h>
struct arr{
int n;
int a[10];
};
void* sum(void *ar){
int sum = 0;
struct arr *ap = (struct arr*) ar;
int count;
for(count = 0; count < ap->n; count++){
sum = sum + ap->a[count];
}
float tbc = (float) sum / ap->n;
printf("TBC %f \n", tbc);
}
void* minArr(void *ar){
struct arr *ap = (struct arr*) ar;
int min = ap->a[0];
int count;
for(count = 0; count < ap->n; count++){


bai4_1_1.c (~/Documents/lab04) - gedit
Open
*bai4_1_2.c
bai4_1_1.c
min = ap->a[count];
}
}
printf("MIN %d\n", min);
}
void* maxArr(void *ar){
struct arr *ap = (struct arr*) ar;
int max = ap->a[0];
int count;
for(count = 0; count < ap->n; count++){
if(max > ap->a[count]){
max = ap->a[count];
}
}
printf("MAX %d\n", max);
}
int main(int argc, char** argv){
struct arr ar;
ar.n = argc - 1;
int i;
for(i = 1; i < argc; i++){
ar.a[i-1] = atoi(argv[i]);
}


bai4_1_1.c (~/Documents/lab04) - gedit
En
Open
*bai4_1_2.c
bai4_1_1.c
}
printf("MAX %d\n", max);
}
int main(int argc, char** argv){
struct arr ar;
ar.n = argc - 1;
int i;
for(i = 1; i < argc; i++){
ar.a[i-1] = atoi(argv[i]);
}
pthread_t tid[4];
pthread_create(&tid[0], NULL, sum, (void*) &ar);
sleep(2);
pthread_create(&tid[1], NULL, minArr, (void*) &ar);
sleep(2);
pthread_create(&tid[2], NULL, maxArr, (void*) &ar);
sleep(2);
return 0;
}



LAB 4.1 bài 2 và GETTIMEOFDAY:

bai4_1_2.c

```c
#include<stdio.h>
#include<pthread.h>
#include<unistd.h>
#include<sys/types.h>
#include<stdlib.h>


void *printprime(int *n)
{
    int  j,flag;


        flag=0;
        for(j=2;j<=*n/2;j++)
        {
            if(*n%j==0)
            {
                flag=1;
                break;
            }
        }

        if(flag==0 && (*n>1))
        {
            printf("%d ", *n);
        }
```

bai4_1_2.c × bai4_1_1.c

```
        struct timeval start, end;
        double time_spent;

        int n = atoi(argv[1]);
        int i=2;
        int j = i+1;
        pthread_t thid[2];

        gettimeofday(&start, NULL);
        while(i <= n || j <= n){

                pthread_create(&thid[0], NULL, printprime,  &i);

                pthread_create(&thid[1], NULL, printprime,  &j);

                for(j = 0; j < 2; j++){
                        pthread_join(thid[j],NULL);
                }
                i++;
                j = i+1;
        }
        gettimeofday(&end, NULL);
        time_spent = ((double) ((double) (end.tv_usec -start.tv_usec)/1000000+
(double) (end.tv_sec-start.tv_sec)));
        printf("time taken for execution: %f seconds\n", time_spent);


    return 0;
```

```
thanh@thanh-VirtualBox:~/Documents/lab04$ gcc -o bai4.out bai4_1_2.o -lpthread
thanh@thanh-VirtualBox:~/Documents/lab04$ ./bai4.out 10
2 3 5 7 time taken for execution: 0.001979 seconds
```

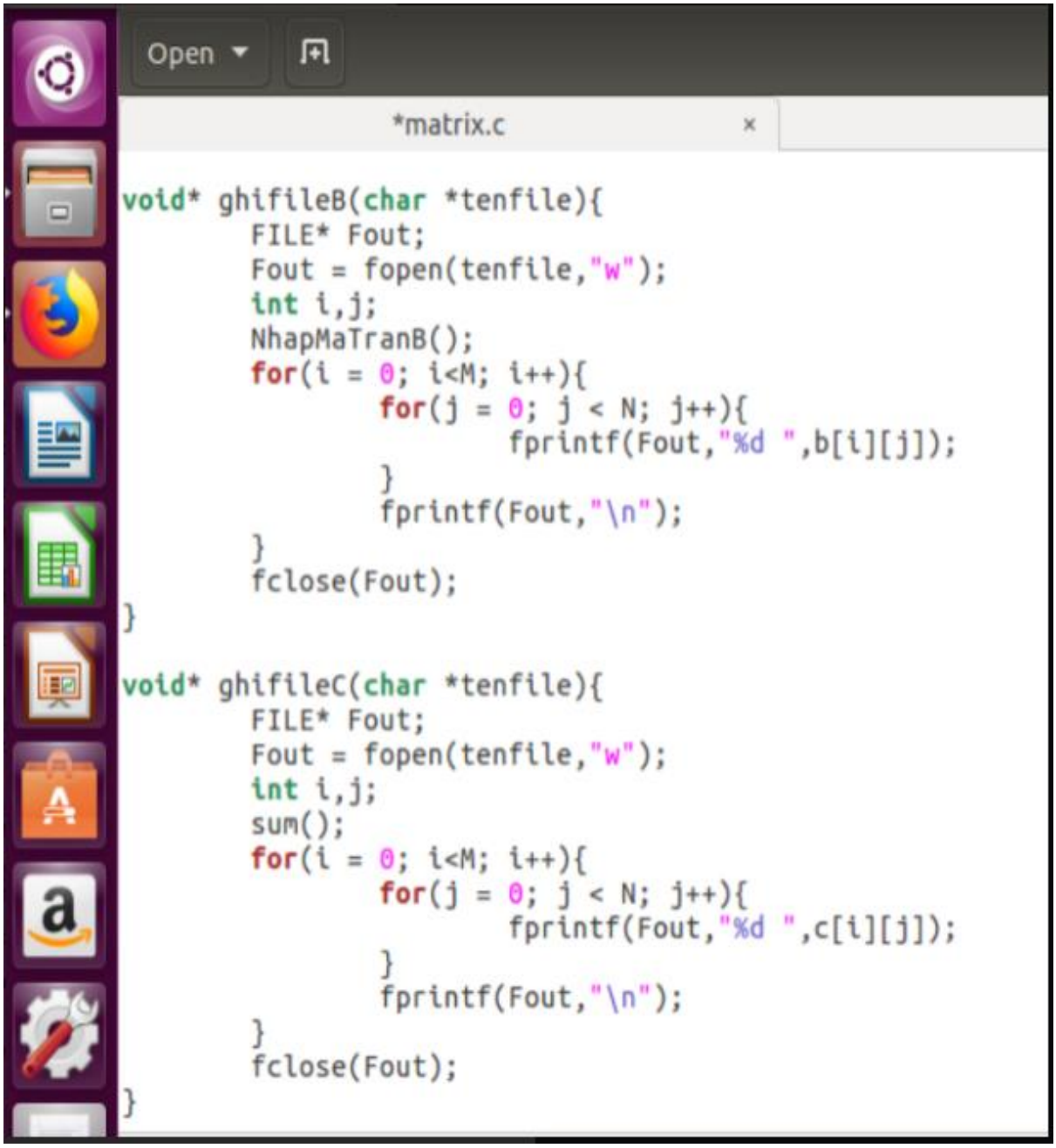
LAB 4.3 ghi file ma trận:

*matrix.c

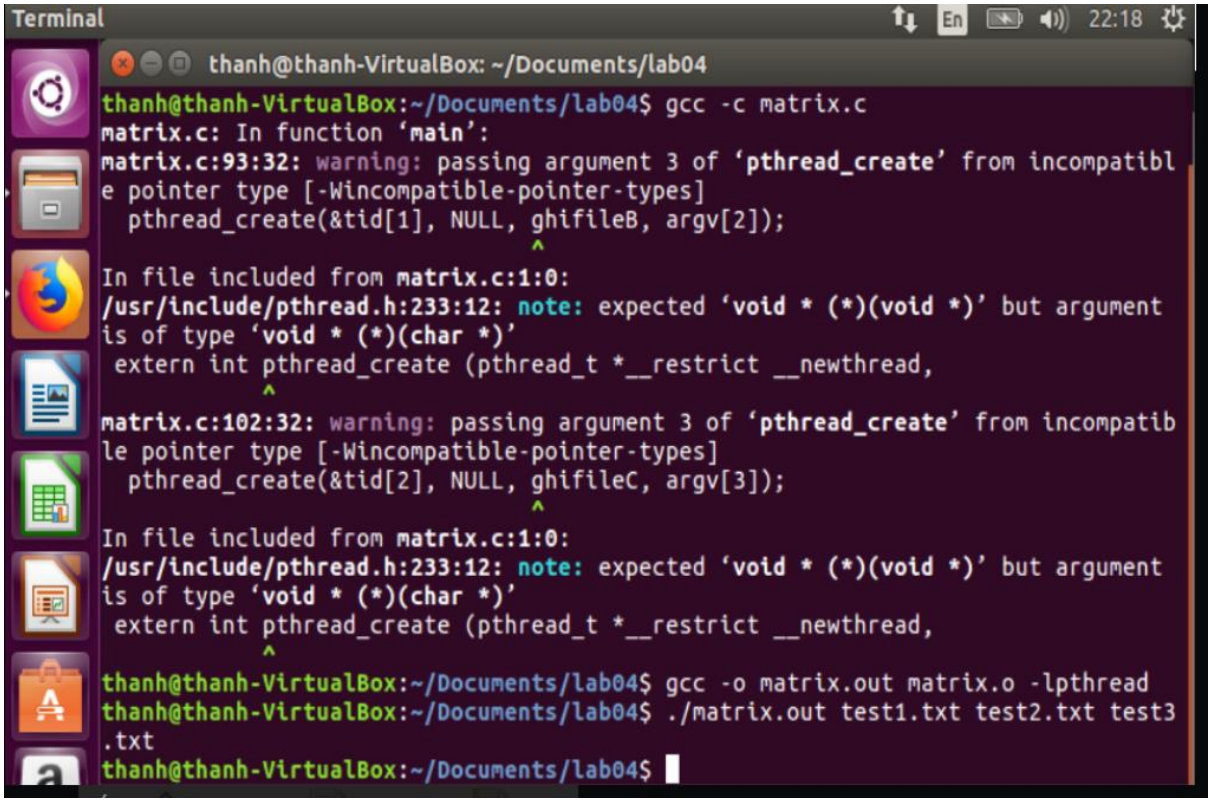
```c
#include<pthread.h>
#include<string.h>
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <sys/types.h>
#include <sys/wait.h>

#define M 5
#define N 5
#define Max_INT 10000


int a[M][N];
int b[M][N];
int c[M][N];

void NhapMaTranA()
{
        int i,j;
   for(i = 0; i < M; i++)
      for(j = 0; j < N; j++)
      {
        a[i][j] = rand()%Max_INT;
      }
}

void NhapMaTranB()
```

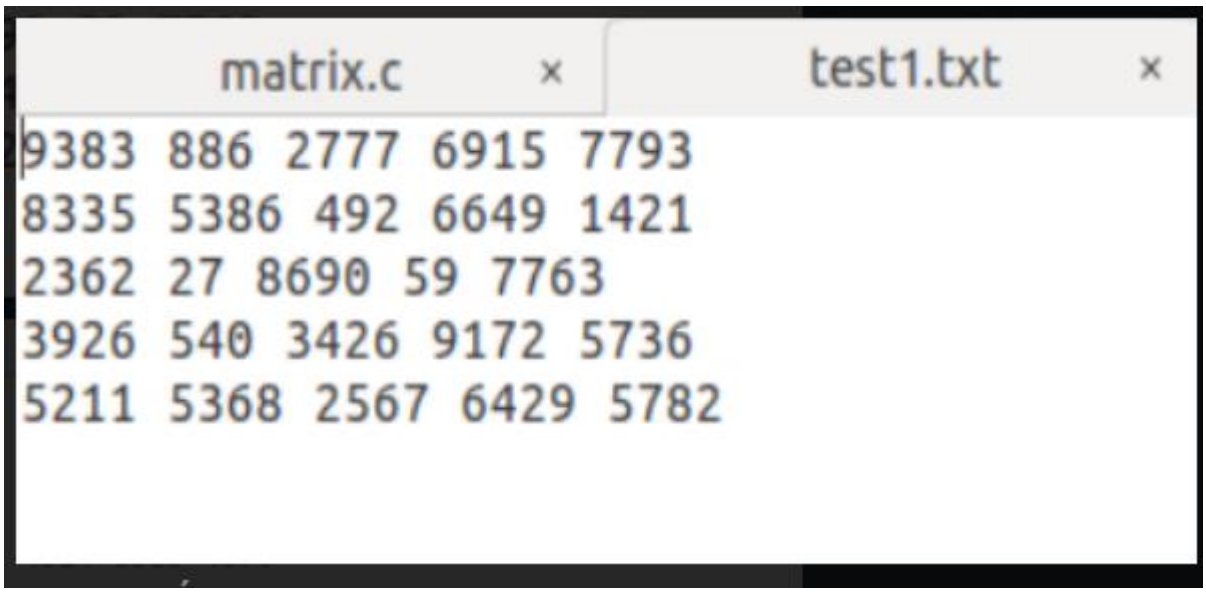
*matrix.c

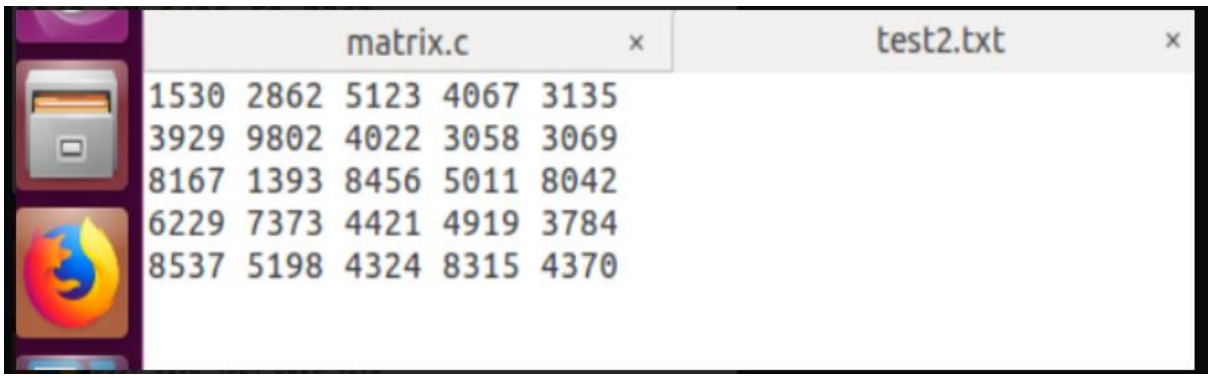
```
void NhapMaTranB()
{
        int i,j;
   for(i = 0; i < M; i++)
      for(j = 0; j < N; j++)
      {
        b[i][j] = rand()%Max_INT;
      }
}

void sum(){
        int i,j;
   for (i = 0; i < M; i++)
      for (j = 0; j < N; j++) {
         c[i][j] = a[i][j] + b[i][j];
      }
}

void* ghifileA(void *tenfile){
        FILE* Fout;
        Fout = fopen(tenfile,"w");
        int i,j;
        NhapMaTranA();
        for(i = 0; i<M; i++){
                for(j = 0; j < N; j++){
                        fprintf(Fout,"%d ",a[i][j]);
                }
                fprintf(Fout,"\n");
```

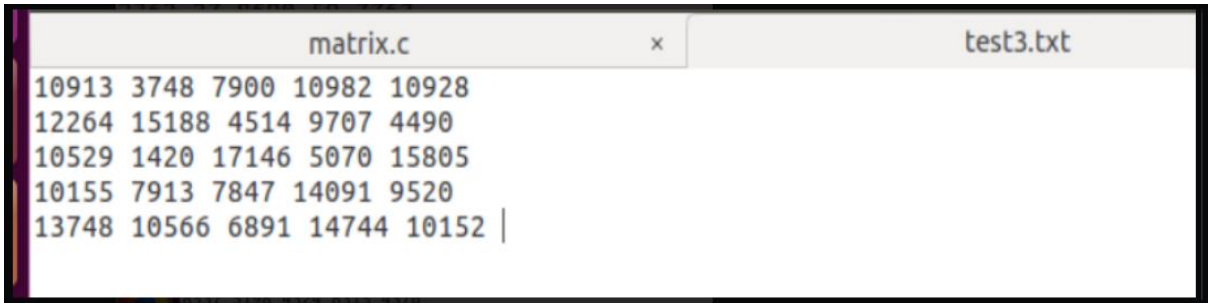

Open
*matrix.c
void* ghifileB(char *tenfile){
FILE* Fout;
Fout = fopen(tenfile,"w");
int i,j;
NhapMaTranB();
for(i = 0; i<M; i++){
for(j = 0; j < N; j++){
fprintf(Fout,"%d ",b[i][j]);
}
fprintf(Fout,"\n");
}
fclose(Fout);
}
void* ghifileC(char *tenfile){
FILE* Fout;
Fout = fopen(tenfile,"w");
int i,j;
sum();
for(i = 0; i<M; i++){
for(j = 0; j < N; j++){
fprintf(Fout,"%d ",c[i][j]);
}
fprintf(Fout,"\n");
}
fclose(Fout);
}

```
                        fprintf(Fout,"%d ",c[i][j]);
                }
                fprintf(Fout,"\n");
        }
        fclose(Fout);
}

int main(int argc, char** argv){

        pthread_t tid[3];
        pthread_create(&tid[0], NULL, ghifileA, argv[1]);
        sleep(1);
        pthread_create(&tid[1], NULL, ghifileB, argv[2]);
        sleep(1);

        int i;
        for(i = 0; i < 2; i++){
                pthread_join(tid[],NULL);
        }


        pthread_create(&tid[2], NULL, ghifileC, argv[3]);
        sleep(1);

        return 0;
}
```


Terminal
22:18
thanh@thanh-VirtualBox: ~/Documents/lab04
thanh@thanh-VirtualBox:~/Documents/lab04$ gcc -c matrix.c
matrix.c: In function 'main':
matrix.c:93:32: warning: passing argument 3 of 'pthread_create' from incompatible pointer type [-Wincompatible-pointer-types]
pthread_create(&tid[1], NULL, ghifileB, argv[2]);
^
In file included from matrix.c:1:0:
/usr/include/pthread.h:233:12: note: expected 'void * (*)(void *)' but argument is of type 'void * (*)(char *)'
extern int pthread_create (pthread_t *__restrict __newthread,
^
matrix.c:102:32: warning: passing argument 3 of 'pthread_create' from incompatible pointer type [-Wincompatible-pointer-types]
pthread_create(&tid[2], NULL, ghifileC, argv[3]);
^
In file included from matrix.c:1:0:
/usr/include/pthread.h:233:12: note: expected 'void * (*)(void *)' but argument is of type 'void * (*)(char *)'
extern int pthread_create (pthread_t *__restrict __newthread,
^
thanh@thanh-VirtualBox:~/Documents/lab04$ gcc -o matrix.out matrix.o -lpthread
thanh@thanh-VirtualBox:~/Documents/lab04$ ./matrix.out test1.txt test2.txt test3.txt
thanh@thanh-VirtualBox:~/Documents/lab04$


matrix.c
test1.txt
9383 886 2777 6915 7793
8335 5386 492 6649 1421
2362 27 8690 59 7763
3926 540 3426 9172 5736
5211 5368 2567 6429 5782


matrix.c
test2.txt
1530 2862 5123 4067 3135
3929 9802 4022 3058 3069
8167 1393 8456 5011 8042
6229 7373 4421 4919 3784
8537 5198 4324 8315 4370


matrix.c
test3.txt
10913 3748 7900 10982 10928
12264 15188 4514 9707 4490
10529 1420 17146 5070 15805
10155 7913 7847 14091 9520
13748 10566 6891 14744 10152