NATIONAL INSTITUTE OF TECHNOLOGY
KARNATAKA

OPERATING SYSTEM LAB

EXPERIMENT : 5

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Code : CS257

Q1) C code for thread synchronization problem

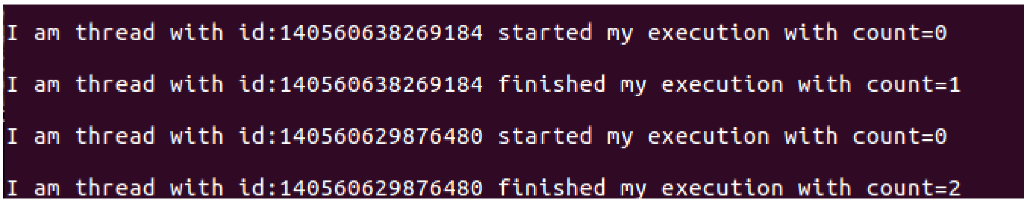
-> implemented without using mutex :

code :

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

pthread_t th1,th2;

//shared data

int count=0;

void* ThFunc()
{


	printf("\nI am thread with id:%lu started my execution with count=
%d\n",pthread_self(),count);

	count++;

	printf("\nI am thread with id:%lu finished my execution with count=
%d\n",pthread_self(),count);

}

int main()
{

	int ret;

	ret=pthread_create(&th1,NULL,&ThFunc,NULL);

	if(ret)
	{
		printf("thread th1 creation was unsuccessful\nwith ERROR:%d",ret);
	}


	ret=pthread_create(&th2,NULL,&ThFunc,NULL);

	if(ret)
	{
		printf("thread th2 creation was unsuccessful\nwith ERROR:%d",ret);
```

```
        }

        pthread_join(th1,NULL);
        pthread_join(th2,NULL);
        pthread_exit(NULL);
}
```

output :



```
I am thread with id:140560638269184 started my execution with count=0

I am thread with id:140560638269184 finished my execution with count=1

I am thread with id:140560629876480 started my execution with count=0

I am thread with id:140560629876480 finished my execution with count=2
```

Q2) C code for solution to thread synchronization problem

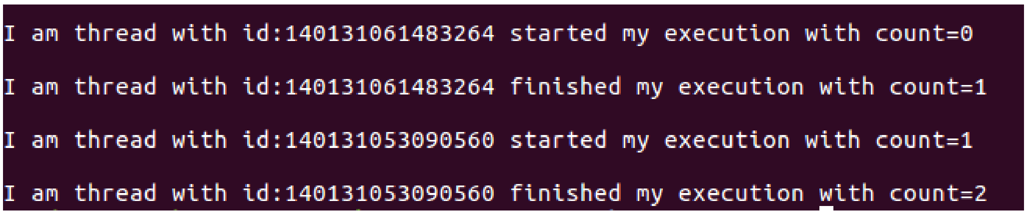
-> implemented with mutex :

code :

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


pthread_mutex_t lock;
pthread_t th1,th2;

//shared data

int count=0;

void* ThFunc()
{
	pthread_mutex_lock(&lock);

	printf("\nI am thread with id:%lu started my execution with count=
%d\n",pthread_self(),count);

	count++;

	printf("\nI am thread with id:%lu finished my execution with count=
%d\n",pthread_self(),count);

	pthread_mutex_unlock(&lock);
}

int main()
{
	pthread_mutex_init(&lock,NULL);
	int ret;

	ret=pthread_create(&th1,NULL,&ThFunc,NULL);

	if(ret)
	{
		printf("thread th1 creation was unsuccessful\nwith ERROR:%d",ret);
	}


	ret=pthread_create(&th2,NULL,&ThFunc,NULL);

	if(ret)
	{
```

```
                printf("thread th2 creation was unsuccessful\nwith ERROR:%d",ret);
        }

        pthread_join(th1,NULL);
        pthread_join(th2,NULL);
        pthread_exit(NULL);
}
```

output :



```
I am thread with id:140131061483264 started my execution with count=0

I am thread with id:140131061483264 finished my execution with count=1

I am thread with id:140131053090560 started my execution with count=1

I am thread with id:140131053090560 finished my execution with count=2
```