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#include <stdio.h>
#include <stdlib.h>
#include <pthread.h>

int a, b, turn;
pthread_mutex_t lock;

void *th0(void *arg)
{
for (int i = 0; i < a; i++)
{
while (turn != 0)
;
pthread_mutex_lock(&lock);
b += 1;
printf("Thr0, (b+1=%d)\n", b);
turn = 1;
pthread_mutex_unlock(&lock);
}
return NULL;
}

void *th1(void *arg)
{
for (int i = 0; i < a; i++)
{
while (turn != 1)
;
pthread_mutex_lock(&lock);
b += 2;
printf("Thr1, (b+2=%d)\n", b);
turn = 2;
pthread_mutex_unlock(&lock);
}
return NULL;
}
```

```
void *th2(void *arg)
{
for (int i = 0; i < a; i++)
{
while (turn != 2)
;
pthread_mutex_lock(&lock);
b += 3;
printf("Thr2, (b+3=%d)\n", b);
turn = 3;
pthread_mutex_unlock(&lock);
}
return NULL;
}

void *th3(void *arg)
{
for (int i = 0; i < a; i++)
{
while (turn != 3)
;
pthread_mutex_lock(&lock);
b += 4;
printf("Thr3, (b+4=%d)\n", b);
turn = 0;
pthread_mutex_unlock(&lock);
}
return NULL;
}

void print_fibonacci(int n)
{
int v1 = 1, v2 = 1, v3;
if (n <= 1)
{
printf("%d ", v1);
}
else
{
printf("%d %d ", v1, v2);
for (int i = 2; i < n; i++)
{
```

```
v3 = v1 + v2;
printf("%d ", v3);
v1 = v2;
v2 = v3;
}
}
printf("\n");
}

int main()
{
printf("Enter integer a value: ");
scanf("%d", &a);
printf("Enter integer b value: ");
scanf("%d", &b);
printf("Enter the Thread # to start first (0 to 3): ");
scanf("%d", &turn);

pthread_t threads[4];
pthread_mutex_init(&lock, NULL);

pthread_create(&threads[0], NULL, th0, NULL);
pthread_create(&threads[1], NULL, th1, NULL);
pthread_create(&threads[2], NULL, th2, NULL);
pthread_create(&threads[3], NULL, th3, NULL);

for (int i = 0; i < 4; i++)
{
pthread_join(threads[i], NULL);
}

printf("Parent, (b=%d)\n", b);
printf("The Fibonacci sequence for %d is:\n", b);
print_fibonacci(b);

pthread_mutex_destroy(&lock);
return 0;
}
```

Result:

```
sajaelkurtehi@Sajas-MacBook-Air Assignment2 % ./prog

Enter integer a value: 2
Enter integer b value: 1
Enter the Thread # to start first (0 to 3): 2
Thr2, (b+3=4)
Thr3, (b+4=8)
Thr0, (b+1=9)
Thr1, (b+2=11)
Thr2, (b+3=14)
Thr3, (b+4=18)
Thr0, (b+1=19)
Thr1, (b+2=21)
Parent, (b=21)
The Fibonacci sequence for 21 is:
1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181 6765 10946
```