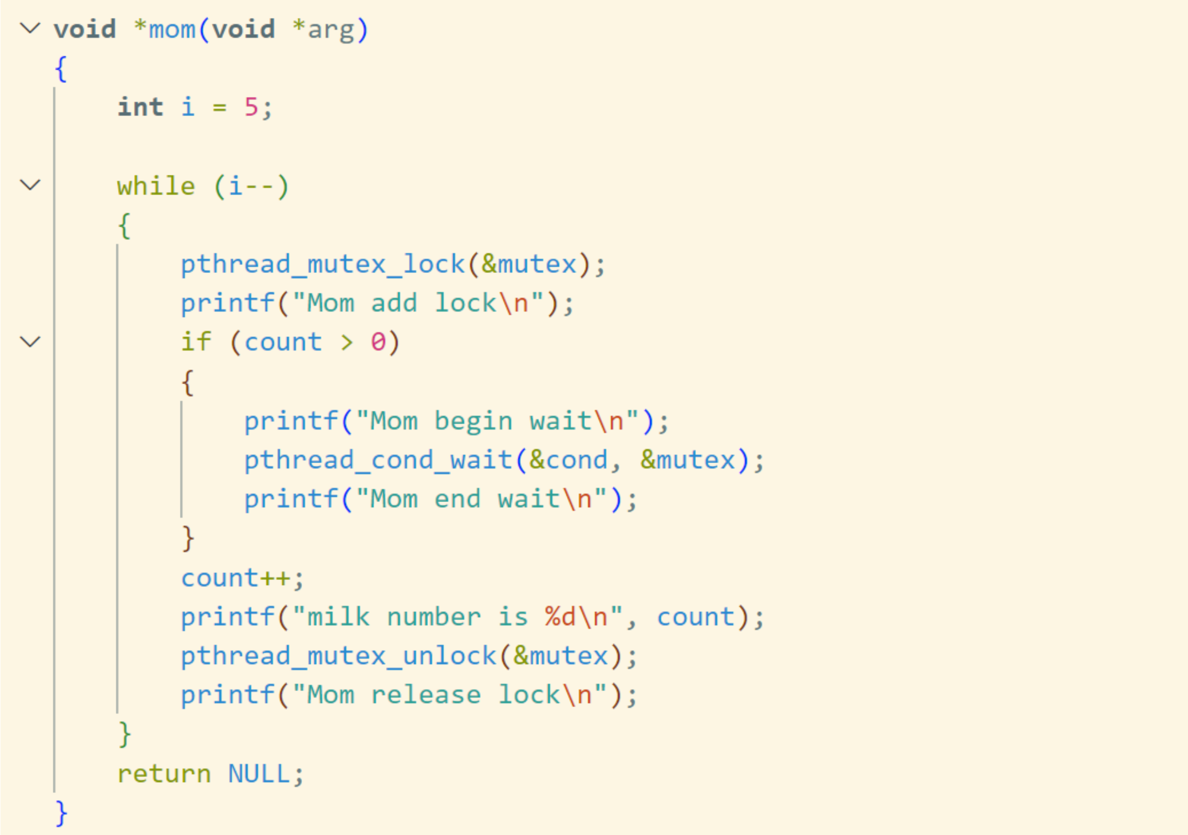
CS334 Lab8 Report

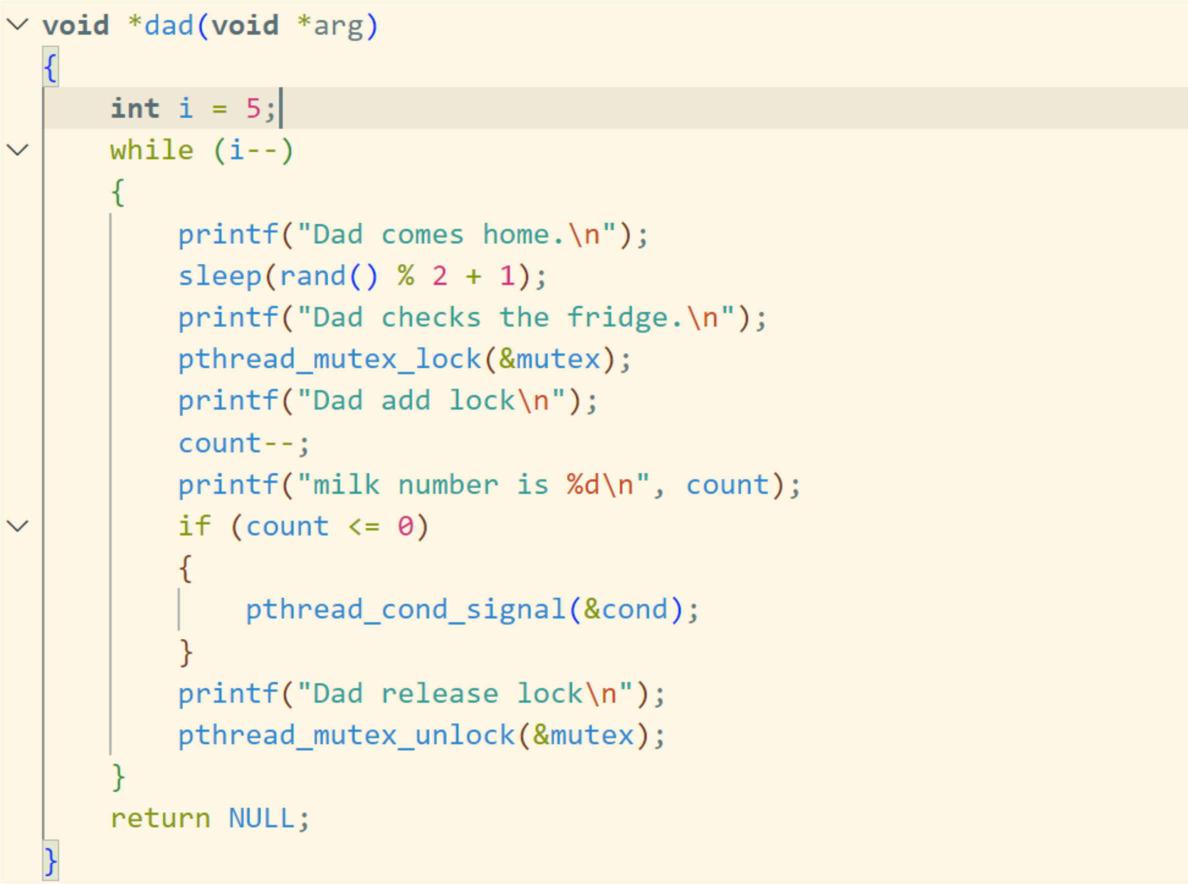
`mom()`



```c
void *mom(void *arg)
{
    int i = 5;

    while (i--)
    {
        pthread_mutex_lock(&mutex);
        printf("Mom add lock\n");
        if (count > 0)
        {
            printf("Mom begin wait\n");
            pthread_cond_wait(&cond, &mutex);
            printf("Mom end wait\n");
        }
        count++;
        printf("milk number is %d\n", count);
        pthread_mutex_unlock(&mutex);
        printf("Mom release lock\n");
    }
    return NULL;
}
```

`dad()`



```c
void *dad(void *arg)
{
    int i = 5;
    while (i--)
    {
        printf("Dad comes home.\n");
        sleep(rand() % 2 + 1);
        printf("Dad checks the fridge.\n");
        pthread_mutex_lock(&mutex);
        printf("Dad add lock\n");
        count--;
        printf("milk number is %d\n", count);
        if (count <= 0)
        {
            pthread_cond_signal(&cond);
        }
        printf("Dad release lock\n");
        pthread_mutex_unlock(&mutex);
    }
    return NULL;
}
```

`me()`

```
void *me(void *arg)
{
    int i = 5;
    while (i--)
    {
        printf("I comes home.\n");
        sleep(rand() % 2 + 1);
        printf("I checks the fridge.\n");
        pthread_mutex_lock(&mutex);
        printf("I add lock\n");
        count--;
        printf("milk number is %d\n", count);
        if (count <= 0)
        {
            pthread_cond_signal(&cond);
        }
        printf("I release lock\n");
        pthread_mutex_unlock(&mutex);
    }
    return NULL;
}
```

`sister()`

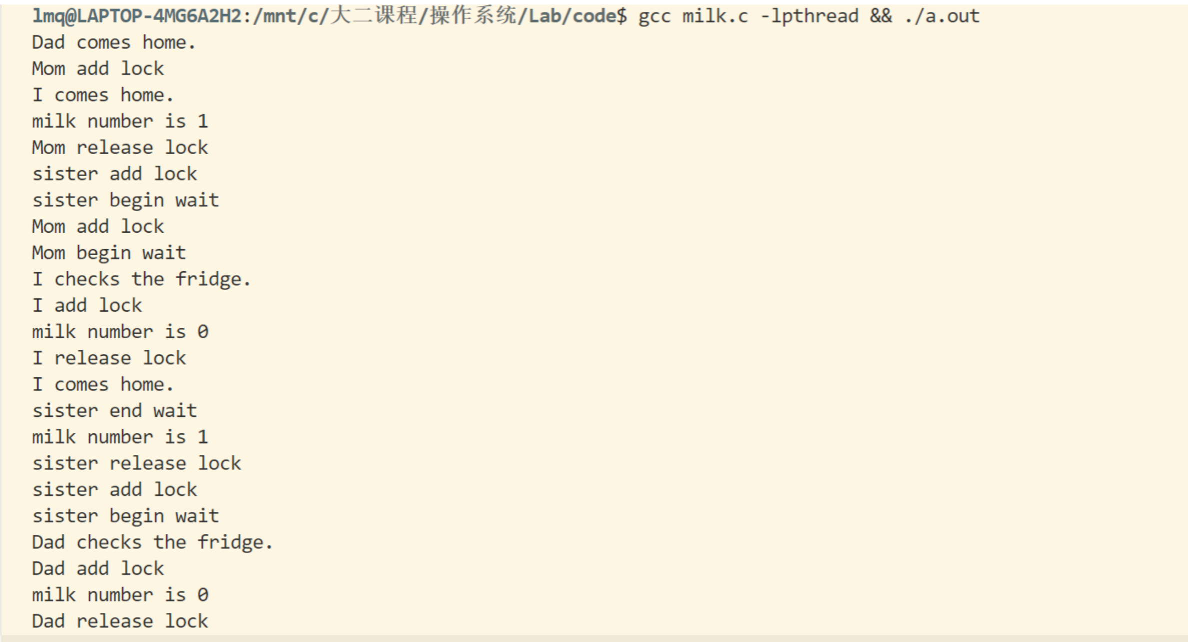
```
void *sister(void *arg)
{
    int i = 5;

    while (i--)
    {
        pthread_mutex_lock(&mutex);
        printf("sister add lock\n");
        if (count > 0)
        {
            printf("sister begin wait\n");
            pthread_cond_wait(&cond, &mutex);
            printf("sister end wait\n");
        }
        count++;
        printf("milk number is %d\n", count);
        pthread_mutex_unlock(&mutex);
        printf("sister release lock\n");
    }
    return NULL;
}
```

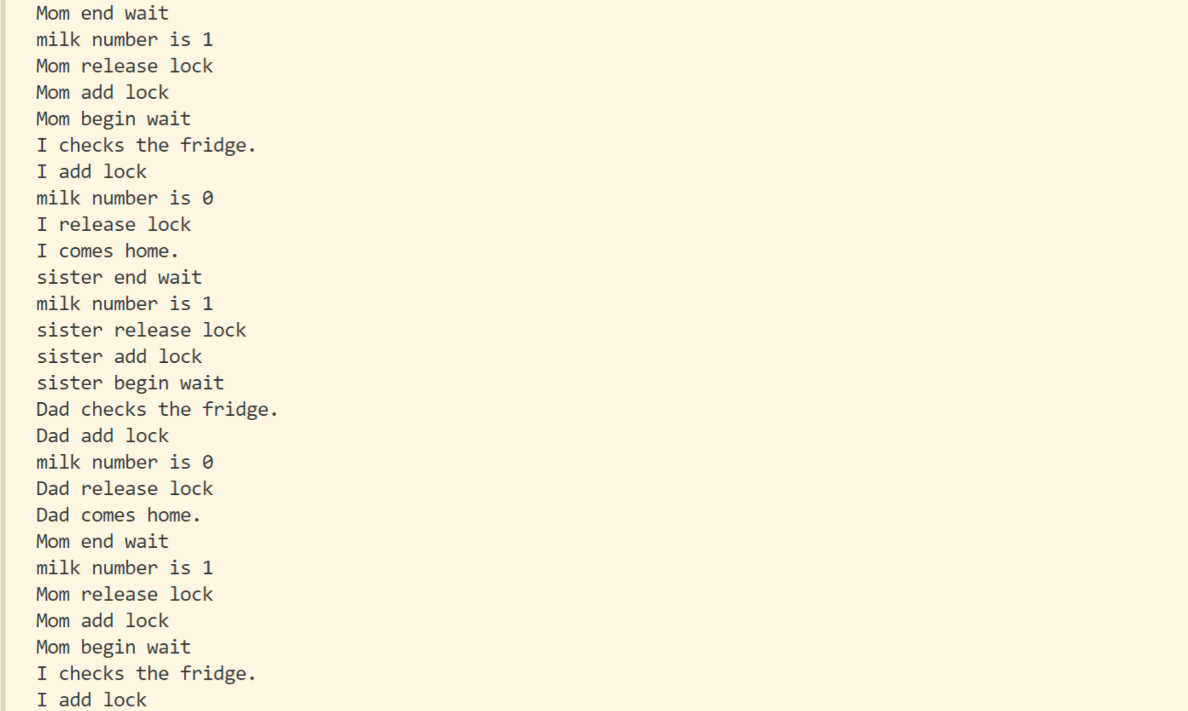
`main()`

```c
int main(int argc, char *argv[])
{
    pthread_t producethread1, producethread2, consumethread1, consumethread2;
    pthread_create(&consumethread1, NULL, dad, NULL);
    pthread_create(&consumethread2, NULL, mom, NULL);
    pthread_create(&producethread1, NULL, me, NULL);
    pthread_create(&producethread2, NULL, sister, NULL);
    pthread_join(producethread1, NULL);
    pthread_join(consumethread1, NULL);
    pthread_join(producethread2, NULL);
    pthread_join(consumethread2, NULL);
    return 0;
}
```

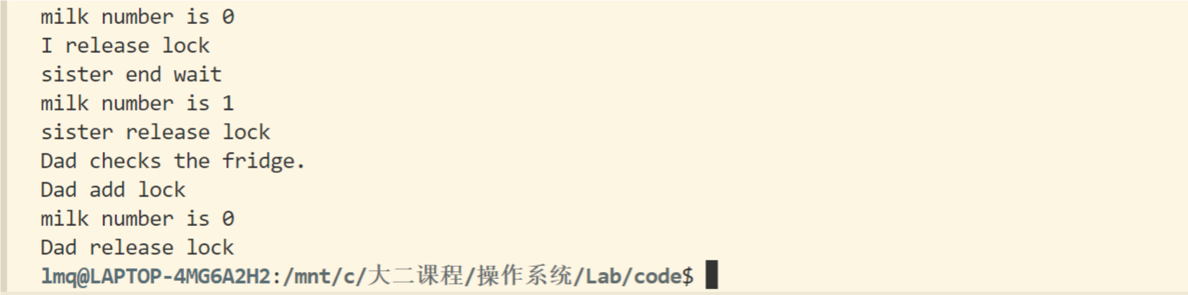
运行结果截图：



```
lmq@LAPTOP-4MG6A2H2:/mnt/c/大二课程/操作系统/Lab/code$ gcc milk.c -lpthread && ./a.out
Dad comes home.
Mom add lock
I comes home.
milk number is 1
Mom release lock
sister add lock
sister begin wait
Mom add lock
Mom begin wait
I checks the fridge.
I add lock
milk number is 0
I release lock
I comes home.
sister end wait
milk number is 1
sister release lock
sister add lock
sister begin wait
Dad checks the fridge.
Dad add lock
milk number is 0
Dad release lock
```



```
Mom end wait
milk number is 1
Mom release lock
Mom add lock
Mom begin wait
I checks the fridge.
I add lock
milk number is 0
I release lock
I comes home.
sister end wait
milk number is 1
sister release lock
sister add lock
sister begin wait
Dad checks the fridge.
Dad add lock
milk number is 0
Dad release lock
Dad comes home.
Mom end wait
milk number is 1
Mom release lock
Mom add lock
Mom begin wait
I checks the fridge.
I add lock
```



```
milk number is 0
I release lock
sister end wait
milk number is 1
sister release lock
Dad checks the fridge.
Dad add lock
milk number is 0
Dad release lock
lmq@LAPTOP-4MG6A2H2:/mnt/c/大二课程/操作系统/Lab/code$ █
```