

OS lab12 Report

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解释 `local_intr_save(intr_flag);` 的作用

在进行某些同步互斥的操作的时候需要先禁用中断，等执行完之后再使用 `local_intr_restore(intr_flag);` 打开中断。

在proc.c中，init_main在852行执行了check_sync()方法。方法通过sync/check_sync.c中part1的算法解决哲学家吃饭问题。

(1) 请描述part1的算法，并回答该算法是否能避免死锁？为什么？

part1能避免死锁。因为当一个进程调用 `phi_take_forks_sema()` 后，会占有 mutex 锁，直到获得全部资源，在此期间其他进程不会进入去抢夺资源。

(2) 注释掉part1，并在part2中实现理论课件中哲学家问题的final solution算法（代码截图，运行结果截图）

```
//-----part2-----  
void phi_test_sema(int i)  
{  
    if(state_sema[i] == HUNGRY && state_sema[LEFT] != EATING && state_sema[RIGHT] != EATING)  
    {  
        state_sema[i] = EATING;  
        up(&s[i]);  
    }  
}  
  
void phi_take_forks_sema(int i)  
{  
    down(&mutex);  
    state_sema[i] = HUNGRY;  
    phi_test_sema(i);  
    up(&mutex);  
    down(&s[i]);  
}  
  
void phi_put_forks_sema(int i)  
{  
    down(&mutex);  
    state_sema[i] = THINKING;  
    phi_test_sema(LEFT);  
    phi_test_sema(RIGHT);  
    up(&mutex);  
}  
//-----end-----
```

Runtime SBI Version : 0.2

MIDELEG : 0x00000000000000222

MEDELEG : 0x0000000000000b109

PMP0 : 0x0000000080000000-0x000000008001ffff (A)

PMP1 : 0x0000000000000000-0xffffffffffffffff (A,R,W,X)

OS is loading ...

memory management: default_pmm_manager

physical memory map:

memory: 0x08800000, [0x80200000, 0x885ffffff].

sched class: stride_scheduler

SWAP: manager = fifo swap manager

++ setup timer interrupts

I am No.4 philosopher_sema

Iter 1, No.4 philosopher_sema is thinking

I am No.3 philosopher_sema

Iter 1, No.3 philosopher_sema is thinking

I am No.2 philosopher_sema

Iter 1, No.2 philosopher_sema is thinking

I am No.1 philosopher_sema

Iter 1, No.1 philosopher_sema is thinking

I am No.0 philosopher_sema

Iter 1, No.0 philosopher_sema is thinking

Iter 1, No.0 philosopher_sema is eating

Iter 1, No.2 philosopher_sema is eating

Iter 2, No.2 philosopher_sema is thinking

Iter 1, No.3 philosopher_sema is eating

Iter 2, No.0 philosopher_sema is thinking

Iter 1, No.1 philosopher_sema is eating

Iter 2, No.1 philosopher_sema is thinking

Iter 2, No.0 philosopher_sema is eating

Iter 2, No.3 philosopher_sema is thinking

Iter 2, No.2 philosopher_sema is eating

Iter 3, No.2 philosopher_sema is thinking

Iter 2, No.3 philosopher_sema is eating

Iter 3, No.0 philosopher_sema is thinking

Iter 2, No.1 philosopher_sema is eating

Iter 3, No.1 philosopher_sema is thinking

Iter 3, No.0 philosopher_sema is eating

Iter 3, No.3 philosopher_sema is thinking

Iter 3, No.2 philosopher_sema is eating

Iter 4, No.2 philosopher_sema is thinking

Iter 3, No.3 philosopher_sema is eating

Iter 4, No.0 philosopher_sema is thinking

Iter 3, No.1 philosopher_sema is eating

Iter 4, No.1 philosopher_sema is thinking

Iter 4, No.0 philosopher_sema is eating

Iter 4, No.3 philosopher_sema is thinking

Iter 4, No.2 philosopher_sema is eating

No.2 philosopher_sema quit

Iter 4, No.3 philosopher_sema is eating

No.0 philosopher_sema quit

Iter 4, No.1 philosopher_sema is eating

No.1 philosopher_sema quit

No.3 philosopher_sema quit

Iter 1, No.4 philosopher_sema is eating

Iter 2, No.4 philosopher_sema is thinking

Iter 2, No.4 philosopher_sema is eating

Iter 3, No.4 philosopher_sema is thinking

Iter 3, No.4 philosopher_sema is eating

Iter 4, No.4 philosopher_sema is thinking

Iter 4, No.4 philosopher_sema is eating

```
No.4 philosopher_sema quit  
all user-mode processes have quit.  
init check memory pass.  
kernel panic at kern/process/proc.c:464:  
    initproc exit.
```

```
o lynchrocket@lynchrocket-virtual-machine:~/Desktop/OSlab/Lab12$
```