## 2.5 实现剪刀石头布程序

2.5.1 设计方案

（1）根据视频中学习相关函数

（2）利用信号量机制与上锁实现线程抢占左右位置，并利用伪随机出剪刀石头布，并根据左右情况判断哪方胜利。

2.5.2 实现方法

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\* Change Logs:

\* Date Author Notes

\* 2018-08-24 yangjie the first version

\*/

#include <rtthread.h>

#define THREAD\_PRIORITY 25

#define THREAD\_STACK\_SIZE 1024

#define THREAD\_TIMESLICE 5

#define MAXSEM 2

static rt\_uint32\_t set, i;

static rt\_thread\_t left\_tid = RT\_NULL;

static rt\_thread\_t right\_tid = RT\_NULL;

//static rt\_thread\_t tid3 = RT\_NULL;

static rt\_uint32\_t array[MAXSEM];

struct rt\_semaphore sem\_lock;

struct rt\_semaphore sem\_empty;

void thread1\_signal\_handler(int sig)

{

rt\_kprintf("thread1 received signal %d\n", sig);

}

static void thread\_entry(void \*parameter)

{

int cnt = 0;

while(cnt < 10){

rt\_sem\_take(&sem\_empty, RT\_WAITING\_FOREVER);

rt\_sem\_take(&sem\_lock, RT\_WAITING\_FOREVER);

if(set % MAXSEM == 0){

array[set%MAXSEM] = (cnt + 1) % 3;

if((cnt + 1) % 3 == 0)

rt\_kprintf("the %d hao chu de shi shitou\n", set%MAXSEM);

else if((cnt + 1) % 3 == 1)

rt\_kprintf("the %d hao chu de shi jiandao\n", set%MAXSEM);

else if((cnt + 1) % 3 == 2)

rt\_kprintf("the %d hao chu de shi bu\n", set%MAXSEM);

}

else{

array[set%MAXSEM] = (cnt + 2) % 3;

if((cnt + 2) % 3 == 0)

rt\_kprintf("the %d hao chu de shi shitou\n", set%MAXSEM);

else if((cnt + 2) % 3 == 1)

rt\_kprintf("the %d hao chu de shi jiandao\n", set%MAXSEM);

else if((cnt + 2) % 3 == 2)

rt\_kprintf("the %d hao chu de shi bu\n", set%MAXSEM);

}

i++;

set++;

if(i % 2 == 0)

{

if(array[0] == 0 && array[1] == 1)

rt\_kprintf("shi tou ying\n", set%MAXSEM);

if(array[0] == 1 && array[1] == 2)

rt\_kprintf("jiandao ying\n", set%MAXSEM);

if(array[0] == 0 && array[1] == 2)

rt\_kprintf("bu ying\n", set%MAXSEM);

if(array[0] == array[1])

rt\_kprintf("ping\n", set%MAXSEM);

if(array[0] == 1 && array[1] == 0)

rt\_kprintf("shitou ying\n", set%MAXSEM);

if(array[0] == 2 && array[1] == 1)

rt\_kprintf("jiandao\n", set%MAXSEM);

if(array[0] == 2 && array[1] == 0)

rt\_kprintf("buying\n", set%MAXSEM);

}

rt\_sem\_release(&sem\_lock);

rt\_sem\_release(&sem\_empty);

cnt++;

rt\_thread\_mdelay(20);

}

//rt\_signal\_install(SIGUSR1, thread1\_signal\_handler);

//rt\_signal\_unmask(SIGUSR1);

//while (cnt < 10)

//{

//rt\_kprintff("thread1 count : %d\n", cnt);

//cnt++;

//rt\_thread\_mdelay(100);

//}

}

int signal\_sample(void)

{

//tid1 = rt\_thread\_create("thread1",

//thread1\_entry, RT\_NULL,

//THREAD\_STACK\_SIZE,

//THREAD\_PRIORITY, THREAD\_TIMESLICE);

//if (tid1 != RT\_NULL)

//rt\_thread\_startup(tid1);

//rt\_thread\_mdelay(300);

//rt\_thread\_kill(tid1, SIGUSR1);

set = 0;

i = 0;

rt\_sem\_init(&sem\_lock, "lock", 1, RT\_IPC\_FLAG\_FIFO);

rt\_sem\_init(&sem\_empty, "lock", MAXSEM, RT\_IPC\_FLAG\_FIFO);

/\* 初始化两个信号量 \*/

//rt\_sem\_init()

left\_tid = rt\_thread\_create("left",

thread\_entry, RT\_NULL,

THREAD\_STACK\_SIZE,

THREAD\_PRIORITY - 1, THREAD\_TIMESLICE);

if (left\_tid != RT\_NULL)

{

rt\_thread\_startup(left\_tid);

}

else

{

rt\_kprintf("create thread left failed");

return -1;

}

right\_tid = rt\_thread\_create("right",

thread\_entry, RT\_NULL,

THREAD\_STACK\_SIZE,

THREAD\_PRIORITY - 1, THREAD\_TIMESLICE);

if (right\_tid != RT\_NULL)

{

rt\_thread\_startup(right\_tid);

}

else

{

rt\_kprintf("create thread right failed");

return -1;

}

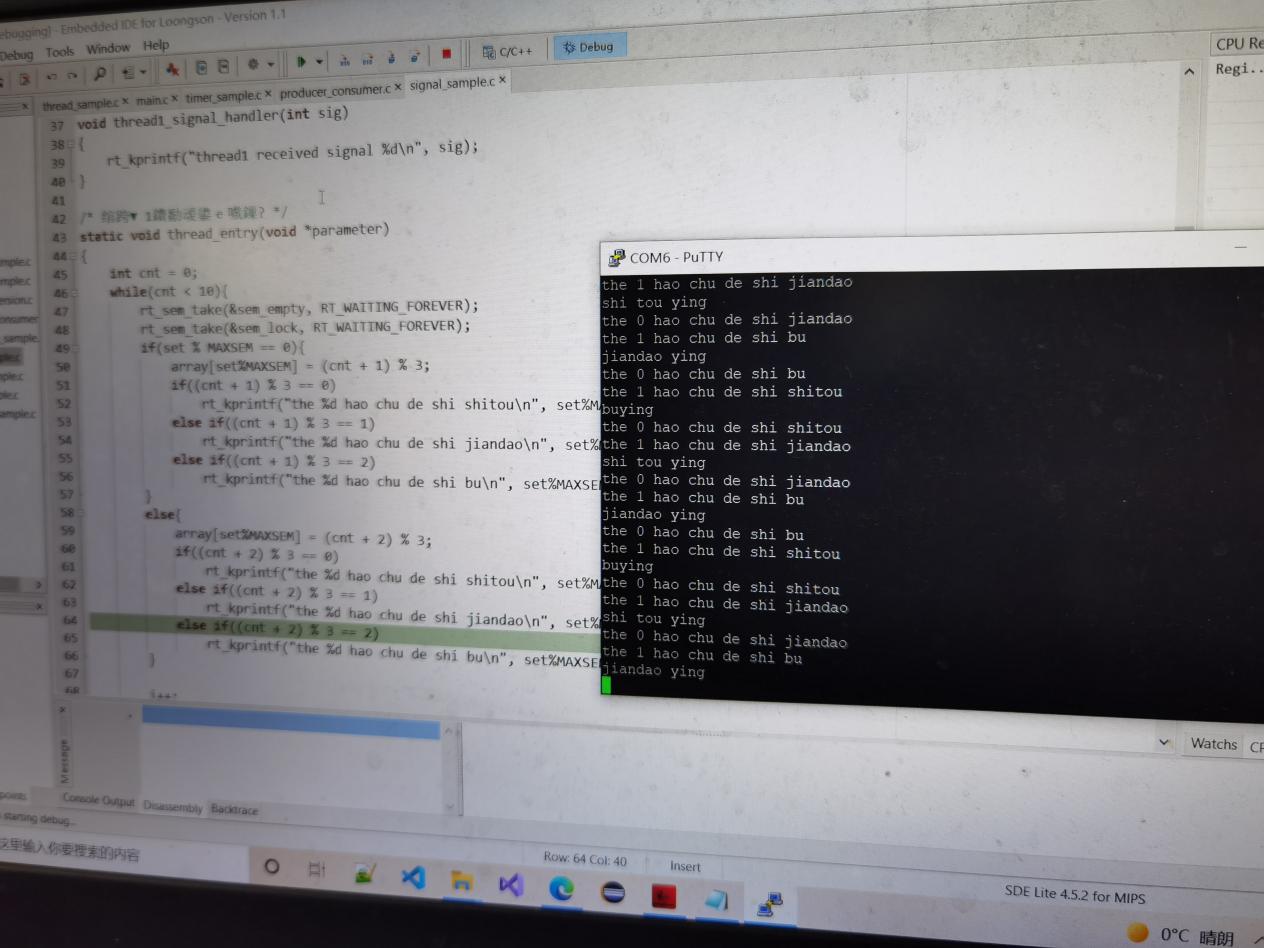
return 0;

}

MSH\_CMD\_EXPORT(signal\_sample, signal sample);

**3.4 实现剪刀石头布**

输入signal\_sample

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遇到问题的解决办法：

具体实现上不会用相关函数实现自己的想法，通过观看视频与阅读sample完成。