

操作系统 lab3 实验报告

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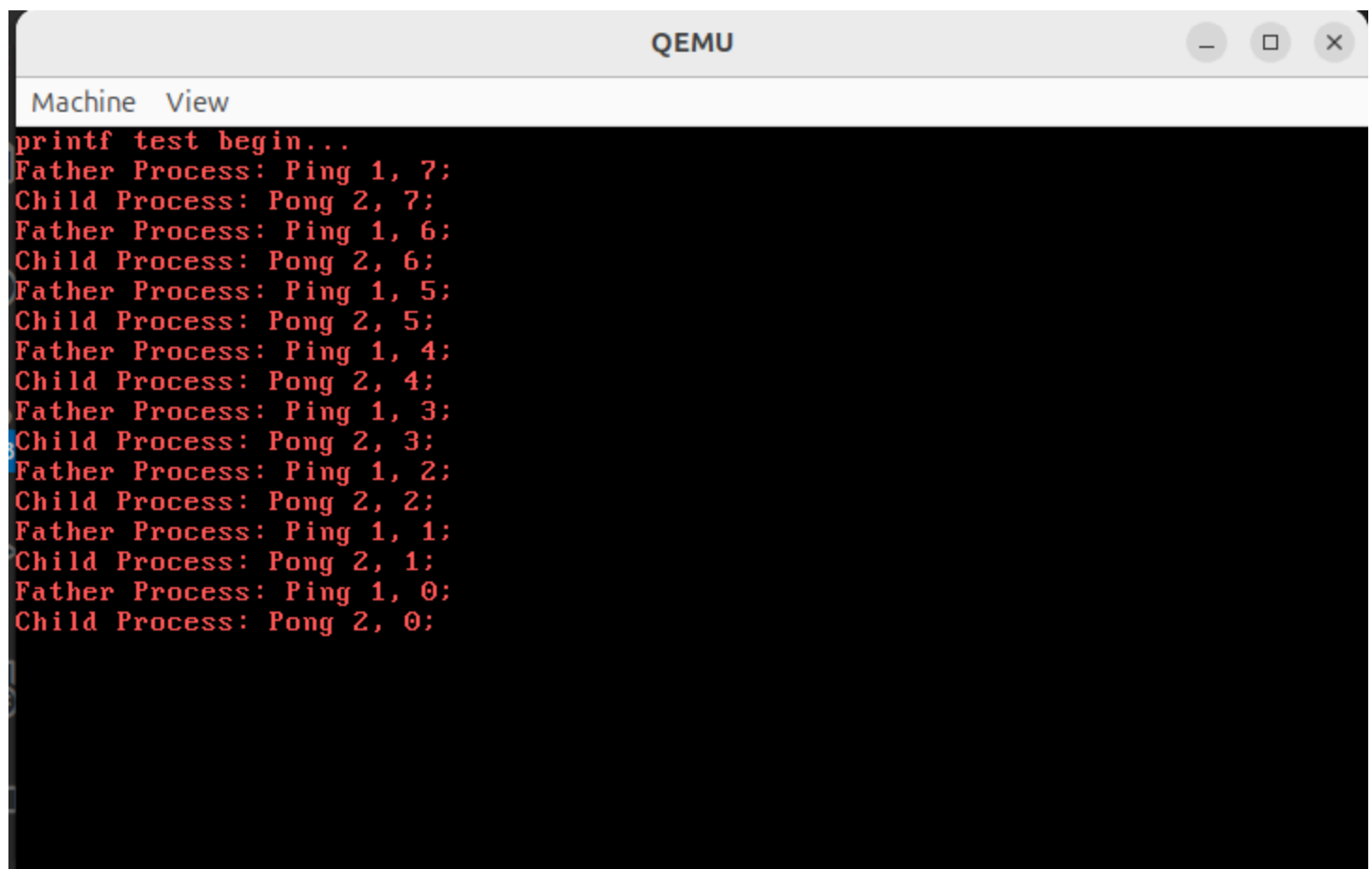
1.实验进度

我完成了选做内容以外的所有内容.

包括库函数,时钟中断处理,以及系统调用例程(fork,sleep,exit)

2.实验结果

如图.



```
Machine View
printf test begin...
Father Process: Ping 1, 7;
Child Process: Pong 2, 7;
Father Process: Ping 1, 6;
Child Process: Pong 2, 6;
Father Process: Ping 1, 5;
Child Process: Pong 2, 5;
Father Process: Ping 1, 4;
Child Process: Pong 2, 4;
Father Process: Ping 1, 3;
Child Process: Pong 2, 3;
Father Process: Ping 1, 2;
Child Process: Pong 2, 2;
Father Process: Ping 1, 1;
Child Process: Pong 2, 1;
Father Process: Ping 1, 0;
Child Process: Pong 2, 0;
```

3.修改的代码

- `app/main.c` 添加了输出测试以及`ret==-1`的情况

- **bootMain和loadUMain** 注释掉phoff和offset
- **makefile** 命令**objcopy ** 添加 -S -j .text
- **memory.h** 将pcb作为全局变量,调整了声明和定义
- **irqHandle.c**
 - 添加四个函数 timerHandle,syscallFork,syscallSleep,syscallExit
 - 修改irqHandle,syscallHandle
- **syscall.c** 完成fork,sleep,exit
- 添加一个**log**函数,用于输出调试信息

4.思考和心得

4.1 initProc()

- 在调试的时候发现一旦进入idle进程过一会便会gp
- 最终发现是之前在initProc的时候我输出了一个调试信息所致,删除掉就好了
- 但是不知为什么会导导致initProc对pcb[0]的初始化失败 🤔,明明在其他函数里log()对函数都没什么影响

```
void initProc() {
    ...
    current = 0; // kernel idle process
    asm volatile("movl %0, %%esp"::"m"(pcb[0].stackTop)); // switch to kernel stack for kernel
    enableInterrupt();
    //log("initProc\n");
    //log是我自己实现的输出调试信息的函数
    asm volatile("int $0x20"); // trigger irqTimer
    while(1)
        waitForInterrupt();
}
```

4.2 中断向量为-1的中断

- 程序在fork之前有一个中断向量为-1的中断,是哪个一直没找出来

```
ljr@ljr-VirtualBox:~/桌面/2023OperatingSystem/lab2/lab2$ make play
qemu-system-i386 -serial stdio os.img
WARNING: Image format was not specified for 'os.img' and probing guessed raw.
       Automatically detecting the format is dangerous for raw images, write o
       perations on block 0 will be restricted.
       Specify the 'raw' format explicitly to remove the restrictions.
kentry
timer
0
1
current timeCount
A
switch to next
1
lrq=-1
Fork
timer
1
1
current timeCount
1
still running,return
isleep
timer
```