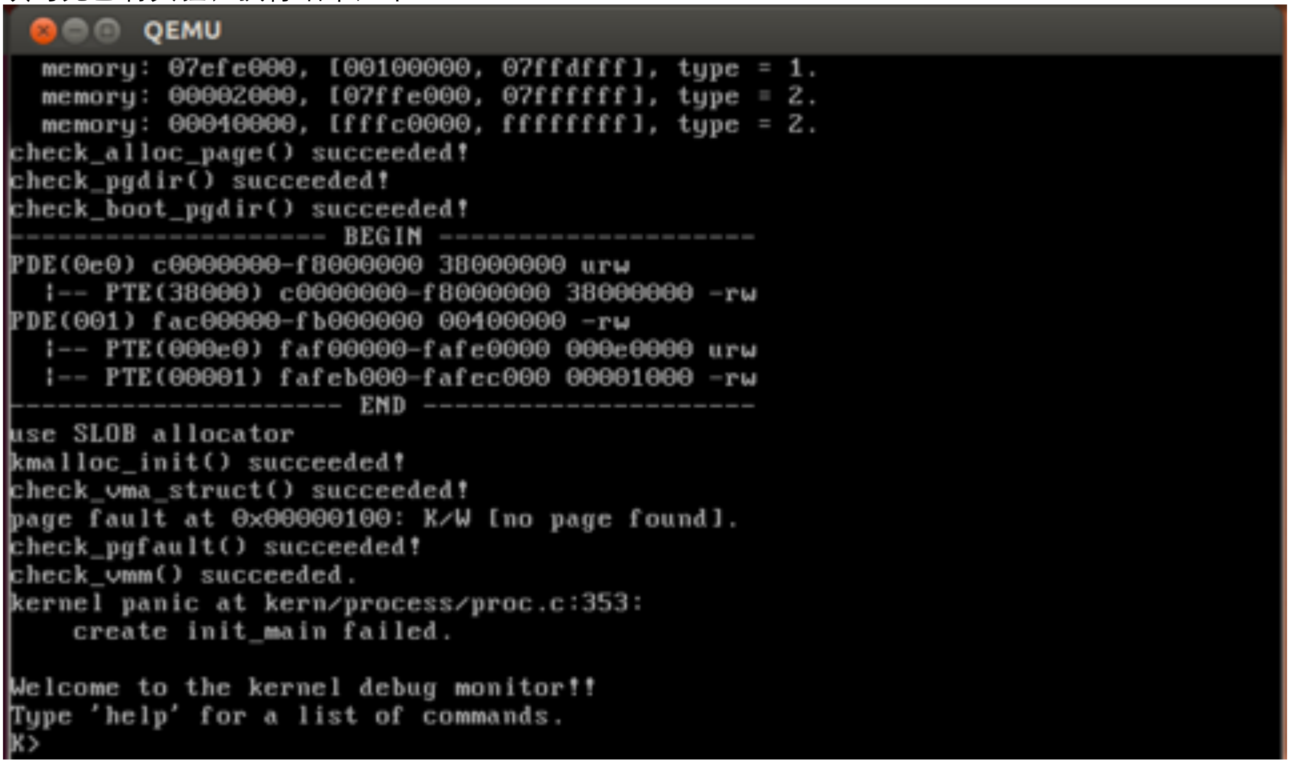
0.
填写完已有实验，执行结果如下：



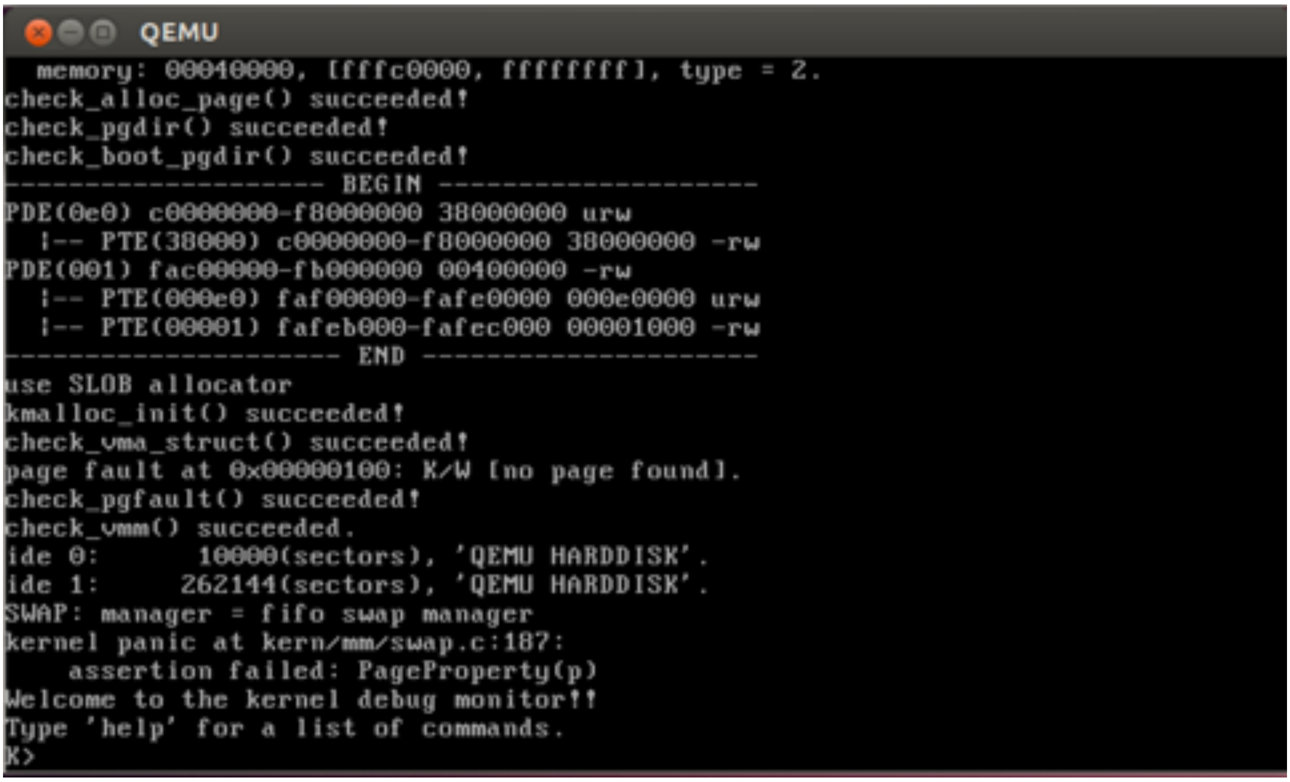
发现程序挂在kern/process/proc.c中，正好就是练习1中需要填充的函数对应的文件。

1.
首先查看注释：
 * below fields in proc_struct need to be initialized
 *   enum proc_state state;   // Process state
 *   int pid;   // Process ID
 *   int runs;   // the running times of Proces
 *   uintptr_t kstack;   // Process kernel stack
 *   volatile bool need_resched;   // bool value: need to be rescheduled to release CPU?
 *   struct proc_struct *parent;   // the parent process
 *   struct mm_struct *mm;   // Process's memory management field
 *   struct context context;   // Switch here to run process
 *   struct trapframe *tf;   // Trap frame for current interrupt
 *   uintptr_t cr3;   // CR3 register: the base addr of Page Directroy Table(PDT)
 *   uint32_t flags;   // Process flag
 *   char name[PROC_NAME_LEN + 1];   // Process name

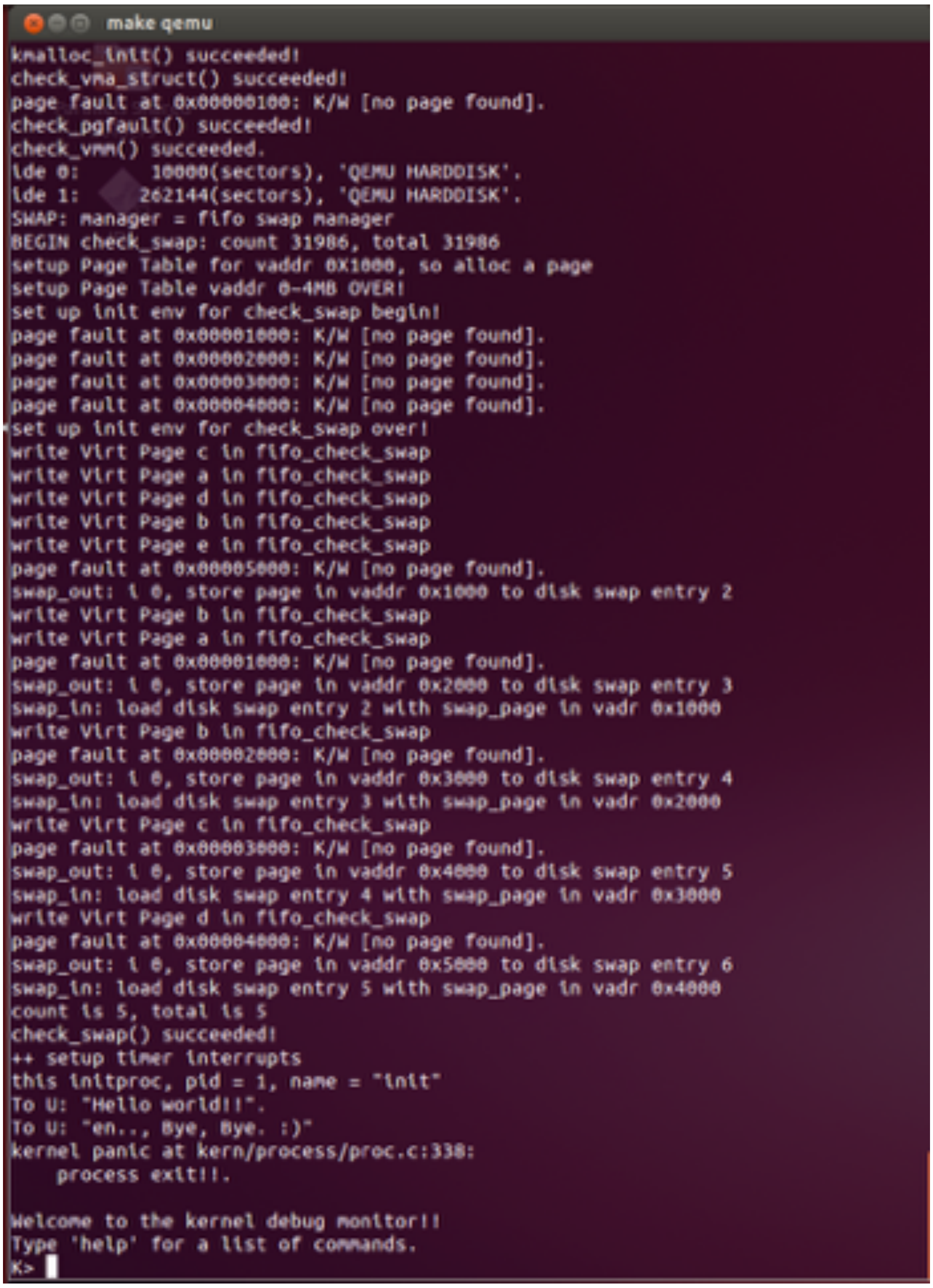
按照注释的顺序来依次初始化各变量：
由于大多数变量只需要初始化为0，故可调用memset来统一清零，再对个别进行设置。
清零后，首先是设置state，找到定义：
// process's state in his life cycle
enum proc_state {
    PROC_UNINIT = 0, // uninitialized
    PROC_SLEEPING,   // sleeping
    PROC_RUNNABLE,   // runnable(maybe running)
    PROC_ZOMBIE,   // almost dead, and wait parent proc to reclaim his resource
};
则此处应为PROC_UNINIT；

接着是pid设为-1，最后将cr3设为内核页目录表boot_cr3。
全部设置完成后，再执行程序，发现执行结果并无变化（除错误行号）。

2.
按照注释的7步，一步步的翻译，需要注意的是前3步失败后要相应的跳转到对应的位置清除已分配的内存并退出。
可却得到如下结果：



调了好久，最后实在是不能理解，然后把lab2中的default_init_memmap、default_alloc_pages、default_free_pages换成标准答案里面的代码就过了，看起来是lab2中的代码有点问题，简直了：



```
make qemu
kmalloc_init() succeeded!
check_vma_struct() succeeded!
page fault at 0x00000100: K/W [no page found].
check_pgfault() succeeded!
check_vmm() succeeded.
ide 0:      10000(sectors), 'QEMU HARDDISK'.
ide 1:     262144(sectors), 'QEMU HARDDISK'.
SWAP: manager = fifo swap manager
BEGIN check_swap: count 31986, total 31986
setup Page Table for vaddr 0X1000, so alloc a page
setup Page Table vaddr 0~4MB OVER!
set up init env for check_swap begin!
page fault at 0x00001000: K/W [no page found].
page fault at 0x00002000: K/W [no page found].
page fault at 0x00003000: K/W [no page found].
page fault at 0x00004000: K/W [no page found].
set up init env for check_swap over!
write Virt Page c in fifo_check_swap
write Virt Page a in fifo_check_swap
write Virt Page d in fifo_check_swap
write Virt Page b in fifo_check_swap
write Virt Page e in fifo_check_swap
page fault at 0x00005000: K/W [no page found].
swap_out: i 0, store page in vaddr 0x1000 to disk swap entry 2
write Virt Page b in fifo_check_swap
write Virt Page a in fifo_check_swap
page fault at 0x00001000: K/W [no page found].
swap_out: i 0, store page in vaddr 0x2000 to disk swap entry 3
swap_in: load disk swap entry 2 with swap_page in vadr 0x1000
write Virt Page b in fifo_check_swap
page fault at 0x00002000: K/W [no page found].
swap_out: i 0, store page in vaddr 0x3000 to disk swap entry 4
swap_in: load disk swap entry 3 with swap_page in vadr 0x2000
write Virt Page c in fifo_check_swap
page fault at 0x00003000: K/W [no page found].
swap_out: i 0, store page in vaddr 0x4000 to disk swap entry 5
swap_in: load disk swap entry 4 with swap_page in vadr 0x3000
write Virt Page d in fifo_check_swap
page fault at 0x00004000: K/W [no page found].
swap_out: i 0, store page in vaddr 0x5000 to disk swap entry 6
swap_in: load disk swap entry 5 with swap_page in vadr 0x4000
count is 5, total is 5
check_swap() succeeded!
++ setup timer interrupts
this initproc, pid = 1, name = "init"
To U: "Hello world!!".
To U: "en.., Bye, Bye. :)"
kernel panic at kern/process/proc.c:338:
    process exit!!.

Welcome to the kernel debug monitor!!
Type 'help' for a list of commands.
K>
```

3.
proc_run首先判断当前运行的线程是否是要切换到的线程，是则不用切换了。
然后屏蔽中断，以防止在线程切换过程中被中断而出现问题。
接着，将任务状态栈ts中的内核栈指针esp0设置好，然后将页目录表加载到cr3中，完成页表切换，最后再调用switch_to实现线程上下文的切换，此时所有的切换操作已经准备好，只需要恢复中断即可完成进程切换。
而switch_to所实现的就是，先将原线程执行时的各个寄存器保存到原线程的content的相应位置，然后再将新线程的content中的值恢复到各寄存器中，实现线程上下文的切换。