

2nd

1. Describe the actions taken by a kernel to context-switch between processes. (同 1st Tb)

A: 内核在进行上下文切换时，首先将当前进程的上下文保存在内存的PCB中，然后经加载调度下一个要执行进程在内存中PCB中的上下文。上下文包含CPU寄存器取指中的内容，堆，用户栈，内存管理信息，数据，文本等。

2. A: pid = 0, pid = 0 时才能进入A语句，表明当前进程为子进程。
B: pid1 = 2603, getpid 获得当前进程 id, 当前为子进程, 为 2603.
C: pid = 2603, fork() 函数在父进程中返回子进程 id, 为 2603.
D: pid1 = 2600, getpid 获得当前进程 id, 当前为父进程, id 为 2600.

Part 2 Thread

1. Discuss the difference between user-level thread and kernel level thread.

A:

User-Level vs. kernel-level

- | | |
|------------------------------|--------------------------------------|
| ① Managed by application | ① Managed by kernel |
| ② kernel not aware of thread | ② consumes kernel resources |
| ③ context switching cheap | ③ context switching expensive |
| ④ create as many as needed | ④ number limited by kernel resources |
| ⑤ be used with care | ⑤ simpler to use |

plus: 调度单位上用户线程以进程为单位，在采用轮转(RR)算法调度时，每个进程分配相同的时间片；内核级线程则每个线程分配时间片。

2. Threads in a multithreaded process share

B. Heap memory and C. Global variables.

(don't share A. Register and D. stack memory)

3. LINEC 输出: CHILD : value = 5

LINEP 输出: PARENT: value = 0

调用 fork() 后，子进程复制父进程内存空间。此后两者独立，父、子进程中修改不相互影响。子进程中修改 value = 5，输出为 value = 5。父进程中该全局变量保持不变，仍为 0，输出 value = 0。