CS354 Lab 1

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Problem 3.1

1. nulluser() is defined in system/initialize.c.
2. The null process, which is the ancestor, is initialized at system/initialize.c:140. The name is 0, which is stored in "NULLPROC" defined in include/process.h.
3. No. The last part of nulluser() is an infinite loop.
4. Running an infinity loop doing nothing to ensure that CPU has something to run when no other process is ready to execute.
5. halt(). It's at system/intr.S:60. The function is just an infinity loop doing nothing.
6. XINU will run as before.

Problem 3.2

1. create() will create a new process, add a new process stack and push arguments and other data into it. Then it call ctxsw to switch to the new process by jumping to the address of the new function after saving some parameters.
2. fork() create a process that has a same copy of resource, arguments, local variable and share the same program as the process calling it. The parent process will run first.
3. The developer should compile the app code together with XINU code to make sure that the app binary is in the binary of XINU.
4. Disadvantages: We must re-compile the whole XINU in order to add an app to XINU.

   Advantages: We don't spend time to load the program from disk.

Problem 3.4

If the calling of kill() will terminate the last process, kill() will call xdone(), and xdone() will call halt(), which is defined in intr.S. And halt() is an infinity loop.

The shutdown procedure should finally shut down the power. Otherwise it will keep consuming power. And If the phone keep running an infinity loop, it will give no response to any of the instruction from user.

Bonus Problem

The new command is implemented in shell/xsh_pcount.c.