Process Management

Objective: In this lab you will exercise some of the concepts related to process creation, destruction and kernel threads by building a LKM called "sleep_killer". Follow the following steps to complete the sleep_killer LKM.

File(s) for this lab:

1. sleep_killer should start a kernel thread and repeatedly poll for user-mode processes that are attempting to use the "sleep" command. Ex. "sleep 10 &" will run the sleep command in the background for 10 seconds and report when complete.

```
[user@localhost Lab5]$
[1]+  Done                    sleep 10
[user@localhost Lab5]$
```

2. Once a sleep process is found, the sleep_killer module should first trace the process hierarchy back to the init process, which as we learned is the parent of all PIDs [1].

```
Found sleep process, tracing back to init ...
        --> sleep [5910]
        --> bash [2880]
        --> gnome-terminal [2878]
        --> init [1]
```

3. Finally sleep_killer should show these processes no mercy by killing them. We will go over signals in a later section, for now use the following function to kill the process:

```
/* force kill the sleep process */
force_sig(9, task);
printk(KERN_INFO "sleep killer LKM killed sleep [%d]\n", task->pid);
```

4. Test your module by starting a sleep command in a separate terminal window and making sure it is automatically killed by your sleep_killer LKM. Your output should look similar to the following:

```
Found sleep process, tracing back to init ...
        --> sleep [5910]
        --> bash [2880]
        --> gnome-terminal [2878]
        --> init [1]
sleep_killer LKM killed sleep [5910]
```

In a separate window a sleep command is started and automatically killed:

```
[user@localhost Lab5]$ sleep 100 &
[1] 6060
[user@localhost Lab5]$
[1]+  Killed                  sleep 100
[user@localhost Lab5]$ █
```

Hints:
- Use the macro "init_task" and task->parent to iterate backwards towards init.
- Keep track of the PID you are watching to avoid spamming your log with the same process.
- A template has been started for you in "LKI/labs/Lab5" folder.