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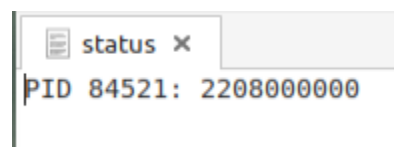
I created a struct to represent a linked list node, which stores data on each process. I used the kernel linked list to store the processes. I made sure to use `spin_lock_irqsave()` and `spin_lock_irqrestore()` to protect data against corruption anytime I did linked list operations.

I defined a 'proc_ops' structure to link the `procfileRead` and `procFileWrite` functions so they would be called when reading from and writing to the proc file. `procfileRead` reads process data from the linked list and copies it into a user-space buffer. `procFileWrite` gets process data from a user-space buffer and writes it into the linked list.

I implemented a timer handler function, which resets the timer every 5 seconds, and calls the work queue handler, which calls `get_cpu_time()` to update the cpu times of each process, and deallocates processes that are terminated.

I initialized the proc entries, linked list, and timer in the `kmlab init` function, and made sure to deallocate everything in the `kmlab exit` function, to ensure there are no memory leaks.

```
leo@leo-VirtualBox:~/Desktop/360/assignment-3-LeoCurdi$ sudo rmmod kmlab
make
sudo insmod kmlab.ko
./userapp 15 &
sleep 6
cat /proc/kmlab/status
rm -f userapp *~ *.ko *.o *.mod.c Module.symvers modules.order
make -C /lib/modules/5.15.0-91-generic/build M=/home/leo/Desktop/360/assignment-3-LeoCurdi
make[1]: Entering directory '/usr/src/linux-headers-5.15.0-91-generic'
  CC [M]  /home/leo/Desktop/360/assignment-3-LeoCurdi/kmlab.o
  MODPOST /home/leo/Desktop/360/assignment-3-LeoCurdi/Module.symvers
  CC [M]  /home/leo/Desktop/360/assignment-3-LeoCurdi/kmlab.mod.o
  LD [M]  /home/leo/Desktop/360/assignment-3-LeoCurdi/kmlab.ko
  BTF [M] /home/leo/Desktop/360/assignment-3-LeoCurdi/kmlab.ko
Skipping BTF generation for /home/leo/Desktop/360/assignment-3-LeoCurdi/kmlab.ko due
make[1]: Leaving directory '/usr/src/linux-headers-5.15.0-91-generic'
gcc -o userapp userapp.c
[1] 84521
PID 84521: 2208000000
leo@leo-VirtualBox:~/Desktop/360/assignment-3-LeoCurdi$
```



```
status x
PID 84521: 2208000000
```

```

leo@leo-VirtualBox:~/Desktop/360/assignment-3-LeoCurdi$ sudo rmmod kmlab
make
sudo insmod kmlab.ko
./userapp 10 &
./userapp 15 &
sleep 6
cat /proc/kmlab/status
[1]+  Done                  ./userapp 15
rm -f userapp *~ *.ko *.o *.mod.c Module.symvers modules.order
make -C /lib/modules/5.15.0-91-generic/build M=/home/leo/Desktop/360/assignment-
make[1]: Entering directory '/usr/src/linux-headers-5.15.0-91-generic'
  CC [M]  /home/leo/Desktop/360/assignment-3-LeoCurdi/kmlab.o
  MODPOST /home/leo/Desktop/360/assignment-3-LeoCurdi/Module.symvers
  CC [M]  /home/leo/Desktop/360/assignment-3-LeoCurdi/kmlab.mod.o
  LD [M]  /home/leo/Desktop/360/assignment-3-LeoCurdi/kmlab.ko
  BTF [M] /home/leo/Desktop/360/assignment-3-LeoCurdi/kmlab.ko
Skipping BTF generation for /home/leo/Desktop/360/assignment-3-LeoCurdi/kmlab.ko
make[1]: Leaving directory '/usr/src/linux-headers-5.15.0-91-generic'
gcc -o userapp userapp.c
[1] 85054
[2] 85055
PID 85054: 4468000000
PID 85055: 4448000000
leo@leo-VirtualBox:~/Desktop/360/assignment-3-LeoCurdi$

```

status x

```

PID 85054: 4468000000
PID 85055: 4448000000

```