

## Compile and Instert:

```
bill@bill:~/Desktop/422/Assignment3/hello_module$ make
make -C /lib/modules/5.4.0-208-generic/build M=/home/bill/Desktop/422/Assignment3/hello_module modules
make[1]: Entering directory '/usr/src/linux-headers-5.4.0-208-generic'
  CC [M]  /home/bill/Desktop/422/Assignment3/hello_module/procReport.o
Building modules, stage 2.
MODPOST 1 modules
  CC [M]  /home/bill/Desktop/422/Assignment3/hello_module/procReport.mod.o
  LD [M]  /home/bill/Desktop/422/Assignment3/hello_module/procReport.ko
make[1]: Leaving directory '/usr/src/linux-headers-5.4.0-208-generic'
bill@bill:~/Desktop/422/Assignment3/hello_module$ sudo insmod ./procReport.ko
[sudo] password for bill:
bill@bill:~/Desktop/422/Assignment3/hello_module$
```

## Message Log:

```
● bill@bill:~/Desktop/422/Assignment3/hello_module$ sudo dmesg
[ 7811.361998] helloModule: kernel module initialized
[ 7811.362001] PROCESS REPORT:
[ 7811.362002] proc_id,proc_name,total_pages
[ 7811.362028] unmapped values found.
[ 7811.362029] 651, loop1, 0
[ 7811.362030] unmapped values found.
[ 7811.362030] 656, loop2, 0
[ 7811.362377] 672, systemd-timesyn, 1231
[ 7811.362520] 719, systemd-network, 1346
[ 7811.362652] 721, systemd-resolve, 2687
[ 7811.363505] 753, accounts-daemon, 1620
[ 7811.363546] 755, avahi-daemon, 799
[ 7811.363672] 756, cupsd, 1719
[ 7811.363728] 757, dbus-daemon, 1375
[ 7811.364513] 758, NetworkManager, 3193
[ 7811.364748] 764, irqbalance, 716
[ 7811.364931] 766, networkd-dispat, 3697
[ 7811.365717] 767, polkitd, 2620
[ 7811.366320] 769, rsyslogd, 1017
[ 7811.370338] 773, snapd, 4381
[ 7811.370990] 776, switcheroo-cont, 1368
[ 7811.371058] 779, systemd-logind, 1367
[ 7811.371970] 782, udisksd, 2268
[ 7811.372018] 783, wpa_supplicant, 846
[ 7811.372047] 786, avahi-daemon, 316
[ 7811.372481] 813, cups-browsed, 2178
[ 7811.373250] 821, ModemManager, 1798
[ 7811.373561] 828, unattended-upgr, 4014
[ 7811.373586] 898, cron, 614
[ 7811.374205] 903, whoopsie, 2839
[ 7811.374222] 904, atd, 490
[ 7811.374243] 908,agetty, 467
[ 7811.374289] 909, kerneloops, 573
[ 7811.374333] 922, kerneloops, 568
[ 7811.374382] 927, sshd, 1153
[ 7811.375059] 928, gdm3, 1816
[ 7811.375418] 997, rtkit-daemon, 673
[ 7811.376008] 1130, upowerd, 1902
[ 7811.376667] 1136, geoclue, 2215
[ 7811.377244] 1293, colord, 3044
[ 7811.377273] 1308, spice-vdagentd, 727
[ 7811.378008] 1337, gdm-session-wor, 1969
[ 7811.378083] 1357, systemd, 1840
[ 7811.378396] 1358, (sd-pam), 1185
[ 7811.382881] 1363, pulseaudio, 3980
[ 7811.383413] 1366, gnome-keyring-d, 1777
[ 7811.383454] 1371, dbus-daemon, 1471
[ 7811.383787] 1374, gdm-x-session, 1404
[ 7811.385879] 1376, Xorg, 41905
[ 7811.386279] 1393, gnome-session-b, 2385
[ 7811.386298] 1462, ssh-agent, 346
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[ 7811.386279] 1393, gnome-session-b, 2385
[ 7811.386298] 1462, ssh-agent, 346
[ 7811.386840] 1479, at-spi-bus-laun, 1483
[ 7811.386868] 1484, dbus-daemon, 876
[ 7811.387187] 1510, gnome-session-c, 1106
[ 7811.387617] 1518, gvfsd, 1531
[ 7811.388289] 1525, gvfsd-fuse, 1402
[ 7811.388573] 1540, dconf-service, 1248
[ 7811.389315] 1544, gnome-session-b, 2836
[ 7811.400728] 1558, gnome-shell, 352626
[ 7811.401203] 1587, ibus-daemon, 1856
[ 7811.401565] 1593, ibus-dconf, 1524
[ 7811.402023] 1594, ibus-extension-, 6224
[ 7811.402368] 1597, ibus-x11, 5150
[ 7811.402728] 1601, ibus-portal, 1519
[ 7811.403069] 1611, at-spi2-registr, 1621
[ 7811.403986] 1615, gnome-shell-cal, 3501
[ 7811.404342] 1616, xdg-permission-, 1306
[ 7811.405883] 1627, evolution-sourc, 4073
[ 7811.406737] 1634, goa-daemon, 4382
[ 7811.407213] 1636, gvfs-udisks2-vo, 2024
[ 7811.407550] 1643, gvfs-goa-volume, 1366
[ 7811.408821] 1644, evolution-calen, 4319
[ 7811.409164] 1656, gvfs-gphoto2-vo, 1501
[ 7811.409620] 1657, goa-identity-se, 1829
[ 7811.409957] 1664, gvfs-mtp-volume, 1412
[ 7811.410414] 1672, gvfs-afc-volume, 1783
[ 7811.411542] 1681, evolution-addre, 3705
[ 7811.411993] 1699, gvfsd-trash, 1835
[ 7811.415259] 1703, gjs, 4700
[ 7811.415689] 1721, gsd-ally-settin, 1437
[ 7811.416594] 1722, gsd-color, 5413
[ 7811.417133] 1723, gsd-datetime, 2752
[ 7811.417560] 1724, gsd-housekeepin, 1657
[ 7811.418061] 1725, gsd-keyboard, 5249
[ 7811.419348] 1726, gsd-media-keys, 5663
[ 7811.420120] 1727, gsd-power, 5469
[ 7811.420563] 1728, gsd-print-notif, 2190
[ 7811.421153] 1729, gsd-rfkill, 1437
[ 7811.421461] 1730, gsd-screensaver, 1331
[ 7811.422067] 1733, gsd-sharing, 1935
[ 7811.422579] 1734, gsd-smartcard, 1706
[ 7811.423063] 1735, gsd-sound, 1844
[ 7811.423663] 1736, gsd-usb-protect, 1537
[ 7811.424134] 1737, gsd-wacom, 5186
[ 7811.424625] 1738, gsd-wwan, 1575
[ 7811.425095] 1739, gsd-xsettings, 5444
[ 7811.425305] 1773, ibus-engine-sim, 1622
[ 7811.425597] 1797, spice-vdagent, 5341
[ 7811.426054] 1820, gsd-printer, 2703
[ 7811.426961] 1843, evolution-alarm, 7806
[ 7811.427267] 1860, gsd-disk-utilit, 1411
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[ 7811.426961] 1843, evolution-alarm, 7806
[ 7811.427267] 1860, gsd-disk-utilit, 1411
[ 7811.428676] 1889, tracker-miner-f, 4751
[ 7811.428888] 1956, gvfsd-metadata, 1420
[ 7811.433973] 2083, firefox, 88628
[ 7811.434343] 2164, Socket Process, 5776
[ 7811.435105] 2177, xdg-desktop-por, 2181
[ 7811.435745] 2181, xdg-document-po, 1388
[ 7811.436376] 2193, xdg-desktop-por, 5240
[ 7811.438769] 2227, WebExtensions, 12256
[ 7811.439522] 2233, RDD Process, 36741
[ 7811.442049] 2262, Privileged Cont, 20471
[ 7811.444471] 2289, Isolated Web Co, 14117
[ 7811.444845] 2369, Utility Process, 5779
[ 7811.447611] 2396, Isolated Web Co, 17550
[ 7811.450037] 2561, Isolated Web Co, 13941
[ 7811.452575] 2622, Isolated Web Co, 21576
[ 7811.453085] 2718, update-notifier, 6434
[ 7811.453521] 2803, gvfsd-network, 1737
[ 7811.453878] 2850, gvfsd-dnssd, 1721
[ 7811.455177] 3321, nautilus, 11116
[ 7812.410603] 3630, code, 35937
[ 7812.437352] 3634, code, 4777
[ 7812.464187] 3635, code, 4701
[ 7812.490919] 3637, code, 2814
[ 7812.518097] 3686, code, 8758
[ 7812.545868] 3769, code, 61727
[ 7813.302358] 3785, code, 17333
[ 7813.302729] 3899, gvfsd-http, 2062
[ 7814.134201] 4154, code, 112628
[ 7814.975037] 4166, code, 14655
[ 7815.969664] 4176, code, 45920
[ 7816.790517] 4242, code, 17862
[ 7816.793045] 4366, Web Content, 9664
[ 7816.795272] 4402, Web Content, 9716
[ 7816.797770] 4448, Web Content, 9736
[ 7816.797902] 5489, cpptools, 4293
[ 7816.797902] unmapped values found.
[ 7816.797902] 5718, kworker/0:0, 0
[ 7816.799239] 5760, gnome-calendar, 7901
[ 7816.799885] 5762, seahorse, 8381
[ 7816.803715] 13939, cpptools-srv, 2773
[ 7816.803715] unmapped values found.
[ 7816.803716] 14721, kworker/1:0, 0
[ 7816.803716] unmapped values found.
[ 7816.803716] 15621, kworker/3:0, 0
[ 7816.803716] unmapped values found.
[ 7816.803717] 15669, kworker/2:0, 0
[ 7816.803717] unmapped values found.
[ 7816.803717] 15866, kworker/u8:0, 0
[ 7816.803718] unmapped values found.
[ 7816.803725] 16245, kworker/2:2, 0
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[ 7816.803717] 15866, kworker/u8:0, 0
[ 7816.803718] unmapped values found.
[ 7816.803725] 16245, kworker/2:2, 0
[ 7816.803725] unmapped values found.
[ 7816.803726] 18529, kworker/3:1, 0
[ 7816.803726] unmapped values found.
[ 7816.803726] 18979, kworker/u8:2, 0
[ 7816.803726] unmapped values found.
[ 7816.803727] 19027, kworker/u8:3, 0
[ 7816.803727] unmapped values found.
[ 7816.803727] 19406, kworker/2:1, 0
[ 7816.803728] unmapped values found.
[ 7816.803728] 19432, kworker/3:2, 0
[ 7816.803743] 19442, anacron, 464
[ 7816.803744] unmapped values found.
[ 7816.803744] 19495, kworker/3:3, 0
[ 7816.803744] unmapped values found.
[ 7816.803744] 19496, kworker/0:2, 0
[ 7816.803744] unmapped values found.
[ 7816.803745] 19517, kworker/2:3, 0
[ 7816.803745] unmapped values found.
[ 7816.803745] 19560, kworker/0:3, 0
[ 7816.803745] unmapped values found.
[ 7816.803745] 20427, kworker/u8:1, 0
[ 7816.803766] 20558, bash, 1236
[ 7816.804278] 20998, tracker-store, 6096
[ 7816.804306] 21105, sudo, 1047
[ 7816.804320] 21124, insmod, 596
[ 7816.804320] There are 237 running processes.
○ bill@bill:~/Desktop/422/Assignment3/hello_module$
```

## Removal and Check:

```
• bill@bill:~/Desktop/422/Assignment3/hello_module$ sudo rmmod ./procReport.ko
• bill@bill:~/Desktop/422/Assignment3/hello_module$ tail -n 20 /var/log/syslog
Mar 17 04:20:52 bill kernel: [ 7816.803744] unmapped values found.
Mar 17 04:20:52 bill kernel: [ 7816.803744] 19496, kworker/0:2, 0
Mar 17 04:20:52 bill kernel: [ 7816.803744] unmapped values found.
Mar 17 04:20:52 bill kernel: [ 7816.803745] 19517, kworker/2:3, 0
Mar 17 04:20:52 bill kernel: [ 7816.803745] unmapped values found.
Mar 17 04:20:52 bill kernel: [ 7816.803745] 19560, kworker/0:3, 0
Mar 17 04:20:52 bill kernel: [ 7816.803745] unmapped values found.
Mar 17 04:20:52 bill kernel: [ 7816.803745] 20427, kworker/u8:1, 0
Mar 17 04:20:52 bill kernel: [ 7816.803766] 20558, bash, 1236
Mar 17 04:20:52 bill kernel: [ 7816.804278] 20998, tracker-store, 6096
Mar 17 04:20:52 bill kernel: [ 7816.804306] 21105, sudo, 1047
Mar 17 04:20:52 bill kernel: [ 7816.804320] 21124, insmod, 596
Mar 17 04:20:52 bill kernel: [ 7816.804320] There are 237 running processes.
Mar 17 04:21:02 bill tracker-store[20998]: OK
Mar 17 04:21:02 bill systemd[1357]: tracker-store.service: Succeeded.
Mar 17 04:21:32 bill anacron[19442]: Job `cron.daily' started
Mar 17 04:21:32 bill anacron[21203]: Updated timestamp for job `cron.daily' to 2025-03-16
Mar 17 04:21:32 bill cracklib: no dictionary update necessary.
Mar 17 04:21:32 bill anacron[19442]: Job `cron.daily' terminated
Mar 17 04:25:23 bill kernel: [ 8087.369692] helloModule: performing cleanup of module
○ bill@bill:~/Desktop/422/Assignment3/hello_module$
```