

Linux Midterm

Part 1.

The command to update linux is `sudo apt-get update`

Part 2.

Creating the directory:

```
vagrant@ubuntu2110:~$ mkdir midterm
vagrant@ubuntu2110:~$ ls
.bash_history  .lessshst  week-three  dir1      .viminfo  .bashrc.swp  .cache  .profile  .  ..
.bash_logout  .vimrc     test        midterm   .bashrc   Documents    path    .ssh      week-two
```

Changing the permissions:

```
vagrant@ubuntu2110:~/midterm$ touch p2-file
vagrant@ubuntu2110:~/midterm$ ls
p2-file  .  ..
vagrant@ubuntu2110:~/midterm$ ls -lrt
total 8
drwxr-x--- 10 vagrant vagrant 4096 Oct 17 11:59 ..
-rw-rw-r-- 1 vagrant vagrant  0 Oct 17 12:00 p2-file
drwxrwxr-x 2 vagrant vagrant 4096 Oct 17 12:00 .
vagrant@ubuntu2110:~/midterm$ chmod u+x
chmod: missing operand after 'u+x'
Try 'chmod --help' for more information.
vagrant@ubuntu2110:~/midterm$ chmod u+x p2-file
vagrant@ubuntu2110:~/midterm$ chmod g-w p2-file
vagrant@ubuntu2110:~/midterm$ ls -lrt
total 8
drwxr-x--- 10 vagrant vagrant 4096 Oct 17 11:59 ..
-rwxr--r-- 1 vagrant vagrant  0 Oct 17 12:00 p2-file
drwxrwxr-x 2 vagrant vagrant 4096 Oct 17 12:00 .
vagrant@ubuntu2110:~/midterm$
```

Part 3.

Using a single find command to delete all .pyc files in both dir1 and dir2:

```
vagrant@ubuntu2110:~/midterm$ find ./dir1 ./dir2 -type f -name "*.pyc" -exec rm {} \;
vagrant@ubuntu2110:~/midterm$ cd dir2
vagrant@ubuntu2110:~/midterm/dir2$ ls
p1.py p2.py p3.py . .. p4.py
vagrant@ubuntu2110:~/midterm/dir2$ cd ..
vagrant@ubuntu2110:~/midterm$ cd dir1
vagrant@ubuntu2110:~/midterm/dir1$ ls
p1.py p2.py p3.py . .. p4.py
vagrant@ubuntu2110:~/midterm/dir1$ |
```

Part 4.

Sorting processes by Resident Set Size (RSS):

```
vagrant@ubuntu2110:~/midterm/dir1$ ps aux --sort -rss
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root      1438  0.0  2.3 948816 48224 ?        Ssl  Oct15   0:27 /usr/lib/snapd/snapd
root       356  0.0  1.0  78904 21436 ?        S<s  Oct15   0:01 /lib/systemd/systemd-journald
root      653  0.0  0.9  30624 18932 ?        Ss   Oct15   0:00 /usr/bin/python3 /usr/bin/networkd-
root      518  0.0  0.9 280824 18612 ?        Ssl  Oct15   0:28 /sbin/multipathd -d -s
systemd+  585  0.0  0.6  23892 13608 ?        Ss   Oct15   0:00 /lib/systemd/systemd-resolved
root        1  0.0  0.6 173952 12296 ?        Ss   Oct15   0:05 /sbin/init =
root      666  0.0  0.6 392900 12172 ?        Ssl  Oct15   0:00 /usr/libexec/udisks2/udisksd
root      715  0.0  0.5 316008 11620 ?        Ssl  Oct15   0:00 /usr/sbin/ModemManager
vagrant   6098  0.0  0.4  15300  9124 ?        Ss   11:58   0:00 /lib/systemd/systemd --user
root      6095  0.0  0.4  14752  9088 ?        Ss   11:58   0:00 sshd: vagrant [priv]
systemd+   407  0.0  0.3  18532  7524 ?        Ss   Oct15   0:00 /lib/systemd/systemd-networkd
root      705  0.0  0.3  13132  7500 ?        Ss   Oct15   0:00 sshd: /usr/sbin/sshd -D [listener]
root      654  0.0  0.3 234168  7160 ?        Ssl  Oct15   0:00 /usr/libexec/polkitd --no-debug
root      664  0.0  0.3  21968  7140 ?        Ss   Oct15   0:00 /lib/systemd/systemd-logind
vagrant   6218  0.0  0.3  14884  6476 ?        S    11:58   0:00 sshd: vagrant@pts/0
root      391  0.0  0.2  10240  5892 ?        Ss   Oct15   0:00 /lib/systemd/systemd-udev
vagrant   6219  0.0  0.2   8744  5476 pts/0    Ss   11:58   0:00 -bash
root      580  0.0  0.2   8564  5060 ?        Ss   Oct15   0:05 /usr/sbin/haveged --Foreground --ve
message+   644  0.0  0.2   8580  4848 ?        Ss   Oct15   0:14 @dbus-daemon --system --address=sys
syslog     657  0.0  0.2 221240  4776 ?        Ssl  Oct15   0:00 /usr/sbin/rsyslogd -n -iNONE
vagrant   6099  0.0  0.2 176708  4776 ?        S    11:58   0:00 (sd-pam)
root      652  0.0  0.1  82476  3996 ?        Ssl  Oct15   0:05 /usr/sbin/irqbalance --foreground
vagrant   6296  0.0  0.1  10052  3512 pts/0    R+   12:15   0:00 ps aux --sort -rss
root      762  0.0  0.1 359644  2996 ?        Sl   Oct15   0:32 /usr/sbin/VBoxService
root      641  0.0  0.1   6880  2920 ?        Ss   Oct15   0:00 /usr/sbin/cron -f -P
root      711  0.0  0.0   2820  1688 ?        S    Oct15   0:11 /usr/sbin/ifplugd -i eth0 -q -f -u0
root      709  0.0  0.0   6140  1080 tty1     Ss+  Oct15   0:00 /sbin/agetty -o -p -- \u --noclear
root        2  0.0  0.0      0      0 ?        S    Oct15   0:00 [kthreadd]
root        3  0.0  0.0      0      0 ?        I<   Oct15   0:00 [rcu_gp]
root        4  0.0  0.0      0      0 ?        I<   Oct15   0:00 [rcu_par_gp]
root        6  0.0  0.0      0      0 ?        I<   Oct15   0:00 [kworker/0:0H-events_highpri]
root        9  0.0  0.0      0      0 ?        I<   Oct15   0:00 [mm_percpu_wq]
root       10  0.0  0.0      0      0 ?        S    Oct15   0:00 [rcu_tasks_rude_]
root       11  0.0  0.0      0      0 ?        S    Oct15   0:00 [rcu_tasks_trace]
```

Opening up htop:

```
vagrant@ubuntu2110:~/midterm/dir1$ htop
vagrant@ubuntu2110:~/midterm/dir1$
```

Sorting by MEM% using F6(SortBy) followed by scrolling down until PERCENT_MEM, then hitting enter:

Sort by	PID	USER	PRI	NI	VIRT	RES	SHR	S	CPU%	MEM%	TIME+	Command
PID	1438	root	20	0	926M	48224	20160	S	0.0	2.4	0:27.28	/usr/lib/snapd/snapd
USER	1456	root	20	0	926M	48224	20160	S	0.0	2.4	0:05.21	/usr/lib/snapd/snapd
PRIORITY	1457	root	20	0	926M	48224	20160	S	0.0	2.4	0:03.12	/usr/lib/snapd/snapd
NICE	1458	root	20	0	926M	48224	20160	S	0.0	2.4	0:00.00	/usr/lib/snapd/snapd
M_VIRT	1459	root	20	0	926M	48224	20160	S	0.0	2.4	0:00.00	/usr/lib/snapd/snapd
M_RESIDENT	1460	root	20	0	926M	48224	20160	S	0.0	2.4	0:04.38	/usr/lib/snapd/snapd
M_SHARE	1472	root	20	0	926M	48224	20160	S	0.0	2.4	0:03.06	/usr/lib/snapd/snapd
STATE	1474	root	20	0	926M	48224	20160	S	0.0	2.4	0:00.00	/usr/lib/snapd/snapd
PERCENT_CPU	1475	root	20	0	926M	48224	20160	S	0.0	2.4	0:02.17	/usr/lib/snapd/snapd
PERCENT_MEM	1527	root	20	0	926M	48224	20160	S	0.0	2.4	0:03.37	/usr/lib/snapd/snapd
TIME	1529	root	20	0	926M	48224	20160	S	0.0	2.4	0:03.50	/usr/lib/snapd/snapd
Command	1740	root	20	0	926M	48224	20160	S	0.0	2.4	0:01.85	/usr/lib/snapd/snapd
	356	root	19	-1	78904	21440	20540	S	0.0	1.1	0:01.72	/lib/systemd/systemd
	653	root	20	0	30624	18932	9916	S	0.0	0.9	0:00.10	/usr/bin/python3 /usr
	518	root	RT	0	274M	18612	8772	S	0.0	0.9	0:28.51	/sbin/multipathd -d -
	519	root	RT	0	274M	18612	8772	S	0.0	0.9	0:01.92	/sbin/multipathd -d -
	520	root	RT	0	274M	18612	8772	S	0.0	0.9	0:00.00	/sbin/multipathd -d -
	521	root	RT	0	274M	18612	8772	S	0.0	0.9	0:00.26	/sbin/multipathd -d -
	522	root	RT	0	274M	18612	8772	S	0.0	0.9	0:12.20	/sbin/multipathd -d -
	523	root	RT	0	274M	18612	8772	S	0.0	0.9	0:00.00	/sbin/multipathd -d -
	524	root	RT	0	274M	18612	8772	S	0.0	0.9	0:00.00	/sbin/multipathd -d -
	585	systemd-r	20	0	23892	13608	9392	S	0.0	0.7	0:00.48	/lib/systemd/systemd
	1	root	20	0	169M	12296	7804	S	0.0	0.6	0:05.63	/sbin/init =
	666	root	20	0	383M	12172	10228	S	0.0	0.6	0:00.35	/usr/libexec/udisks2
	676	root	20	0	383M	12172	10228	S	0.0	0.6	0:00.01	/usr/libexec/udisks2
	682	root	20	0	383M	12172	10228	S	0.0	0.6	0:00.00	/usr/libexec/udisks2
	739	root	20	0	383M	12172	10228	S	0.0	0.6	0:00.00	/usr/libexec/udisks2
	787	root	20	0	383M	12172	10228	S	0.0	0.6	0:00.00	/usr/libexec/udisks2
	715	root	20	0	308M	11620	9860	S	0.0	0.6	0:00.06	/usr/sbin/ModemManag
	746	root	20	0	308M	11620	9860	S	0.0	0.6	0:00.00	/usr/sbin/ModemManag
	751	root	20	0	308M	11620	9860	S	0.0	0.6	0:00.00	/usr/sbin/ModemManag
	6098	vagrant	20	0	15300	9124	7648	S	0.0	0.5	0:00.08	/lib/systemd/systemd
	6095	root	20	0	14752	9088	7656	S	0.0	0.4	0:00.01	sshd: vagrant [priv]
	407	systemd-n	20	0	18532	7524	6692	S	0.0	0.4	0:00.30	/lib/systemd/systemd
	705	root	20	0	13132	7500	6588	S	0.0	0.4	0:00.01	sshd: /usr/sbin/sshd
	654	root	20	0	228M	7160	6420	S	0.0	0.4	0:00.02	/usr/libexec/polkitd
	658	root	20	0	228M	7160	6420	S	0.0	0.4	0:00.00	/usr/libexec/polkitd
	681	root	20	0	228M	7160	6420	S	0.0	0.4	0:00.01	/usr/libexec/polkitd
	664	root	20	0	21968	7140	6308	S	0.0	0.4	0:00.63	/lib/systemd/systemd
	6218	vagrant	20	0	14884	6476	4908	S	0.0	0.3	0:00.22	sshd: vagrant@pts/0
	391	root	20	0	10240	5892	4000	S	0.0	0.3	0:00.37	/lib/systemd/systemd
	6219	vagrant	20	0	8744	5476	3716	S	0.0	0.3	0:00.09	-bash
	580	root	20	0	8564	5060	1916	S	0.0	0.2	0:05.08	/usr/sbin/haveged --
EnterSort	EscCancel											

Part 6.

Creating a new user with the username MIDTERM with a home directory using -m and setting the default shell to bash using -s /bin/bash. Gave MIDTERM sudo group privileges, gave MIDTERM a password and then used su to login to MIDTERM:

```
vagrant@ubuntu2110:~$ useradd -m -g sudo -s /bin/bash MIDTERM
useradd: Permission denied.
useradd: cannot lock /etc/passwd; try again later.
vagrant@ubuntu2110:~$ sudo useradd -m -g sudo -s /bin/bash MIDTERM
vagrant@ubuntu2110:~$ sudo passwd MIDTERM
New password:
Retype new password:
passwd: password updated successfully
vagrant@ubuntu2110:~$ su MIDTERM
Password:
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

MIDTERM@ubuntu2110:/home/vagrant$ whoami
MIDTERM
MIDTERM@ubuntu2110:/home/vagrant$
```

Checking for shell:

```
MIDTERM@ubuntu2110:/home/vagrant$ echo $SHELL
/bin/bash
MIDTERM@ubuntu2110:/home/vagrant$ |
```

Ensuring sudo privileges:

```
vagrant@ubuntu2110:~$ sudo usermod -aG sudo MIDTERM
vagrant@ubuntu2110:~$ su MIDTERM
Password:
```

Checking for sudo privileges:

```
MIDTERM@ubuntu2110:/home/vagrant$ groups MIDTERM
MIDTERM : sudo
MIDTERM@ubuntu2110:/home/vagrant$ |
```

Part 7.

Editing .profile and adding the export Editor=vim line:

```
# ~/.profile: executed by the command interpreter for login shells.
# This file is not read by bash(1), if ~/.bash_profile or ~/.bash_login
# exists.
# see /usr/share/doc/bash/examples/startup-files for examples.
# the files are located in the bash-doc package.

# the default umask is set in /etc/profile; for setting the umask
# for ssh logins, install and configure the libpam-umask package.
#umask 022

# if running bash
if [ -n "$BASH_VERSION" ]; then
    # include .bashrc if it exists
    if [ -f "$HOME/.bashrc" ]; then
        . "$HOME/.bashrc"
    fi
fi

# set PATH so it includes user's private bin if it exists
if [ -d "$HOME/bin" ] ; then
    PATH="$HOME/bin:$PATH"
fi

# set PATH so it includes user's private bin if it exists
if [ -d "$HOME/.local/bin" ] ; then
    PATH="$HOME/.local/bin:$PATH"
fi

# This is part of the midterm
export EDITOR=vim
~
~
~
~
~
~
-- INSERT --
```

These are the commands, as well as applying changes without rebooting:

```
vagrant@ubuntu2110:~$ vim .profile
vagrant@ubuntu2110:~$ source ~/.profile
vagrant@ubuntu2110:~$ echo $EDITOR
vim
vagrant@ubuntu2110:~$
```

Part 8.

Using a grep command to filter for “normal” users assuming their UID is between 1000 and 9999.

```
vagrant@ubuntu2110:~$ grep -E 'x:100[1001-9999]++:' /etc/passwd
vagrant:x:1000:1000:~/home/vagrant:/bin/bash
mailbox:x:1001:1001:~/home/mailbox:/bin/bash
Kevin-Linux:x:1002:1002:~/home/Kevin-Linux:/bin/bash
MIDTERM:x:1003:27:~/home/MIDTERM:/bin/bash
vagrant@ubuntu2110:~$ |
```