Project 3: Linux Project

Lab Exercise 1: File Manipulation and Permissions

1. Create a directory named "lab_files" and set its permissions to read, write, and execute for the owner, read and execute for the group, and read-only for others.

```
Last login: Wed Jul 24 10:39:25 on ttys000
djpriya@5ce91e9213ed ~ % mkdir -p lab_files && chmod 754 lab_files
```

2. Inside "lab_files", create a file named "data.txt" containing some text.

```
[ec2-user@ip-172-31-30-216 ~]$ echo "I am a DJ Priya but not a real DJ" > lab_files/data.txt
```

3. Change the ownership of "data.txt" to another user.

```
[ec2-user@ip-172-31-30-216 ~]$ sudo useradd Merica
[ec2-user@ip-172-31-30-216 ~]$ sudo chown Merica:users lab_files/data.txt
[ec2-user@ip-172-31-30-216 ~]$
```

4. Set the sticky bit on "lab_files" directory.

```
[ec2-user@ip-172-31-30-216 ~]$ chmod +t lab_files
```

5. Find all files with ".txt" extension in "lab_files" directory and its subdirectories.

```
[ec2-user@ip-172-31-30-216 ~]$ ls lab_files/*.txt
lab_files/data.txt
```

Lab Exercise 2: User and Group Management

1. Create a new group named "developers".

```
[ec2-user@ip-172-31-30-216 ~]$ sudo groupadd developers
```

2. Add the user "intern" to the "developers" group.

```
[ec2-user@ip-172-31-30-216 ~]$ sudo useradd intern
[ec2-user@ip-172-31-30-216 ~]$ sudo usermod -a -G developers intern
```

3. List all groups the "intern" user belongs to.

```
[ec2-user@ip-172-31-30-216 ~]$ id -G -n intern
intern developers
```

4. Display detailed information about the "developers" group.

```
[ec2-user@ip-172-31-30-216 ~]$ getent group developers
developers:x:1002:intern
```

Lab Exercise 3: Process Management

1. Displaying Running Processes

```
[ec2-user@ip-172-31-30-216 ~]$ ps aux
USER         PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root           1  0.0  0.4 105180 16360 ?        Ss   21:53   0:01 /usr/lib/systemd/systemd --swi
root           2  0.0  0.0      0     0 ?        S    21:53   0:00 [kthreadd]
root           3  0.0  0.0      0     0 ?        I<   21:53   0:00 [rcu_gp]
root           4  0.0  0.0      0     0 ?        I<   21:53   0:00 [rcu_par_gp]
root           5  0.0  0.0      0     0 ?        I<   21:53   0:00 [slub_flushwq]
root           6  0.0  0.0      0     0 ?        I<   21:53   0:00 [netns]
root           8  0.0  0.0      0     0 ?        I<   21:53   0:00 [kworker/0:0H-events_highpri]
root          10  0.0  0.0      0     0 ?        I<   21:53   0:00 [mm_percpu_wq]
root          11  0.0  0.0      0     0 ?        I    21:53   0:00 [rcu_tasks_kthread]
root          12  0.0  0.0      0     0 ?        I    21:53   0:00 [rcu_tasks_rude_kthread]
root          13  0.0  0.0      0     0 ?        I    21:53   0:00 [rcu_tasks_trace_kthread]
root          14  0.0  0.0      0     0 ?        S    21:53   0:00 [ksoftirqd/0]
root          15  0.0  0.0      0     0 ?        I    21:53   0:00 [rcu_preempt]
root          16  0.0  0.0      0     0 ?        S    21:53   0:00 [migration/0]
root          18  0.0  0.0      0     0 ?        S    21:53   0:00 [cpuhp/0]
root          19  0.0  0.0      0     0 ?        S    21:53   0:00 [cpuhp/1]
root          20  0.0  0.0      0     0 ?        S    21:53   0:00 [migration/1]
root          21  0.0  0.0      0     0 ?        S    21:53   0:00 [ksoftirqd/1]
root          23  0.0  0.0      0     0 ?        I<   21:53   0:00 [kworker/1:0H-events_highpri]
root          25  0.0  0.0      0     0 ?        S    21:53   0:00 [kdevtmpfs]
```

2. Displaying Dynamic View of Processes

```
[ec2-user@ip-172-31-30-216 ~]$ top

top - 23:25:16 up  1:31,  1 user,  load average: 0.00, 0.00, 0.00
Tasks: 108 total,   1 running, 107 sleeping,   0 stopped,   0 zombie
%Cpu(s):  0.0 us,  0.0 sy,  0.0 ni,100.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
MiB Mem :   3904.3 total,   3471.0 free,    171.2 used,    262.2 buff/cache
MiB Swap:      0.0 total,      0.0 free,      0.0 used.   3523.2 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
      1 root      20   0  105180  16360  10036 S   0.0   0.4   0:01.48 systemd
      2 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kthreadd
      3 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_gp
      4 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_par_gp
      5 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 slub_flushwq
      6 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 netns
      8 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/0:0H-events_high+
     10 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 mm_percpu_wq
     11 root      20   0       0      0      0 I   0.0   0.0   0:00.00 rcu_tasks_kthread
     12 root      20   0       0      0      0 I   0.0   0.0   0:00.00 rcu_tasks_rude_kthread
     13 root      20   0       0      0      0 I   0.0   0.0   0:00.00 rcu_tasks_trace_kthread
     14 root      20   0       0      0      0 S   0.0   0.0   0:00.07 ksoftirqd/0
     15 root      20   0       0      0      0 I   0.0   0.0   0:00.20 rcu_preempt
     16 root      rt   0       0      0      0 S   0.0   0.0   0:00.03 migration/0
```

3.Terminate a process

```
[ec2-user@ip-172-31-30-216 ~]$ pgrep vim
[ec2-user@ip-172-31-30-216 ~]$ nice -n 24 vim &
[1] 32719
[ec2-user@ip-172-31-30-216 ~]$ kill -9 32719

[1]+  Stopped                 nice -n 24 vim
```

4.Adjust process priority

```
djpriya@5ce91e9213ed desktop % nice -n 13 vim &
[6] 6532
```

5.Adjust running process priority

```
djpriya@5ce91e9213ed desktop % renice -n 10 6532
djpriya@5ce91e9213ed desktop %
```

Lab Exercise 4: Networking

1.Display network interface configuration.

```
[ec2-user@ip-172-31-30-216 ~]$ ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
       valid_lft forever preferred_lft forever
2: enX0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 9001 qdisc mq state UP group default qlen 1000
    link/ether 0a:ff:fe:82:84:a5 brd ff:ff:ff:ff:ff:ff
    altname eni-06e043a921e8c737e
    altname device-number-0
    inet 172.31.30.216/20 metric 512 brd 172.31.31.255 scope global dynamic enX0
       valid_lft 2296sec preferred_lft 2296sec
    inet6 fe80::8ff:feff:fe82:84a5/64 scope link
       valid_lft forever preferred_lft forever
```

2.Test network connectivity to a remote host(e.g. google.com)

```
[ec2-user@ip-172-31-30-216 ~]$ ping google.com
PING google.com (142.251.167.100) 56(84) bytes of data.
64 bytes from ww-in-f100.1e100.net (142.251.167.100): icmp_seq=1 ttl=105 time=1.85 ms
64 bytes from ww-in-f100.1e100.net (142.251.167.100): icmp_seq=2 ttl=105 time=1.87 ms
64 bytes from ww-in-f100.1e100.net (142.251.167.100): icmp_seq=3 ttl=105 time=1.90 ms
64 bytes from ww-in-f100.1e100.net (142.251.167.100): icmp_seq=4 ttl=105 time=1.86 ms
64 bytes from ww-in-f100.1e100.net (142.251.167.100): icmp_seq=5 ttl=105 time=1.88 ms
64 bytes from ww-in-f100.1e100.net (142.251.167.100): icmp_seq=6 ttl=105 time=1.87 ms
64 bytes from ww-in-f100.1e100.net (142.251.167.100): icmp_seq=7 ttl=105 time=1.85 ms
64 bytes from ww-in-f100.1e100.net (142.251.167.100): icmp_seq=8 ttl=105 time=1.87 ms
64 bytes from ww-in-f100.1e100.net (142.251.167.100): icmp_seq=9 ttl=105 time=1.84 ms
64 bytes from ww-in-f100.1e100.net (142.251.167.100): icmp_seq=10 ttl=105 time=1.84 ms
64 bytes from ww-in-f100.1e100.net (142.251.167.100): icmp_seq=11 ttl=105 time=1.85 ms
^C
--- google.com ping statistics ---
11 packets transmitted, 11 received, 0% packet loss, time 10016ms
rtt min/avg/max/mdev = 1.841/1.861/1.900/0.016 ms
```

3.Query DNS servers for information about a domain name(e.g. google.com)

```
; <<>> DiG 9.10.6 <<>> google.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 53060
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;google.com.                    IN      A

;; ANSWER SECTION:
google.com.             117     IN      A       142.250.217.110

;; Query time: 20 msec
;; SERVER: 10.148.160.74#53(10.148.160.74)
;; WHEN: Thu Jul 25 10:56:31 PDT 2024
;; MSG SIZE  rcvd: 55
```

```
djpriya@5ce91e9213ed desktop % nslookup google.com
Server:         10.148.160.74
Address:        10.148.160.74#53

Non-authoritative answer:
Name:   google.com
Address: 142.250.69.206
```

Lab Exercise 5: Install AWS CLI

curl “https://awscli.amazonaws.com/awscli-exe-linux-x86_64.zip" -o "awscliv2.zip"

unzip awscliv2.zip

sudo ./aws/install

```
djpriya@5ce91e9213ed desktop % sudo ./aws/install
./aws/install: line 78: /Users/djpriya/Desktop/aws/dist/aws: cannot execute binary file
You can now run: /usr/local/bin/aws --version
```

Install AWS CLI on your environment.