

Linux Assignment 1

This document contains the breakdown of tasks for Assignment 1 including commands used, step-by-step explanations, and screenshots.

Task 1: Basic Linux Commands in a Real-World Scenario

Scenario: Your manager asks you to set up a project directory for a new team and verify system details before installation.

Check current logged-in user and system information

Command:

whoami

uname -a

Explanation: Displays the current user and system information.

Screenshot:

```
[ec2-user@ip-172-31-11-3 ~]$ whoami
ec2-user
[ec2-user@ip-172-31-11-3 ~]$ uname -a
Linux ip-172-31-11-3.ap-south-1.compute.internal 6.1.134-150.224.amzn2023.x86_64
#1 SMP PREEMPT_DYNAMIC Tue Apr 22 22:24:52 UTC 2025 x86_64 x86_64 x86_64 GNU/Linux
```

Navigate to the /projects directory and list contents

Command:

cd /projects

ls -l

Explanation: Navigates to the /projects directory and lists its contents.

Screenshot:

```
[ec2-user@ip-172-31-11-3 ~]$ ls -l
total 8
-rw-r--r--. 1 root    root      45 May 10 06:52 archive.tar.gz
-rw-r--r--. 1 ec2-user ec2-user 258 May 10 07:22 syslog.txt
[ec2-user@ip-172-31-11-3 ~]$ mkdir projects
[ec2-user@ip-172-31-11-3 ~]$ cd /projects
-bash: cd: /projects: No such file or directory
[ec2-user@ip-172-31-11-3 ~]$ ls -l
total 8
-rw-r--r--. 1 root    root      45 May 10 06:52 archive.tar.gz
drwxr-xr-x. 2 ec2-user ec2-user  6 May 16 12:10 projects
-rw-r--r--. 1 ec2-user ec2-user 258 May 10 07:22 syslog.txt
[ec2-user@ip-172-31-11-3 ~]$ cd projects
[ec2-user@ip-172-31-11-3 projects]$ ls -l
total 0
```

Create a new project directory and verify it

Command:

```
mkdir projectB
```

```
ls -l
```

Explanation: Creates a directory named projectB and verifies it exists.

Screenshot:

```
Fast login: 111 May 16 12:07:51 2023 from 202.47.33.138
[ec2-user@ip-172-31-11-3 ~]$ mkdir projectB
[ec2-user@ip-172-31-11-3 ~]$ ls -l
total 8
-rw-r--r--. 1 root      root      45 May 10 06:52 archive.tar.gz
drwxr-xr-x. 2 ec2-user ec2-user   6 May 16 12:15 projectB
drwxr-xr-x. 3 ec2-user ec2-user  22 May 16 12:11 projects
-rw-r--r--. 1 ec2-user ec2-user 258 May 10 07:22 syslog.txt
```

Create a sample file inside projectB

Command:

```
touch projectB/README.txt
```

```
echo "Welcome to Project B" > projectB/README.txt
```

```
cat projectB/README.txt
```

Explanation: Creates a README file with sample text and displays its content.

Screenshot:

```
[ec2-user@ip-172-31-11-3 ~]$ cd projectB
[ec2-user@ip-172-31-11-3 projectB]$ touch README.txt

[ec2-user@ip-172-31-11-3 ~]$ cd projectB
[ec2-user@ip-172-31-11-3 projectB]$ ls -l
total 0
-rw-r--r--. 1 ec2-user ec2-user 0 May 16 12:16 README.txt
[ec2-user@ip-172-31-11-3 projectB]$ echo "Welcome to ProjectB" >README.txt
[ec2-user@ip-172-31-11-3 projectB]$ cat README.txt
Welcome to ProjectB
[ec2-user@ip-172-31-11-3 projectB]$ |
```

Task 2: User and Group Permissions Management

Scenario: A new employee, John, joins the developers team. He needs access to projectB, but shouldn't be able to modify system files.

Create a new user john and add him to the developers group

Command:

```
sudo useradd -m -G developers john
```

```
sudo passwd john
```

Explanation: Creates a user 'john' with a home directory and adds him to the developers group.

Screenshot:

```
[ec2-user@ip-172-31-11-3 projectB]$ sudo groupadd developers
[ec2-user@ip-172-31-11-3 projectB]$ sudo useradd -m -G developers john
useradd: group 'developersjohn' does not exist
[ec2-user@ip-172-31-11-3 projectB]$ sudo useradd -m -G developers john
[ec2-user@ip-172-31-11-3 projectB]$ sudo passwd john
Changing password for user john.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
Sorry, passwords do not match.
New password:
BAD PASSWORD: The password fails the dictionary check - it is too simplistic/sy
tematic
Retype new password:
passwd: all authentication tokens updated successfully.
```

Verify user and group

Command:

```
id john
```

Explanation: Verifies the user ID and group memberships of 'john'.

Screenshot:

```
[ec2-user@ip-172-31-11-3 projectB]$ id john
uid=1001(john) gid=1002(john) groups=1002(john),1001(developers)
```

Change group ownership of projectB to developers

Command:

```
sudo chown :developers /projects/projectB
```

Explanation: Changes the group ownership of projectB to 'developers'.

Screenshot:

```
[ec2-user@ip-172-31-11-3 ~]$ cd projectB
[ec2-user@ip-172-31-11-3 projectB]$ sudo chown :developers .
[ec2-user@ip-172-31-11-3 projectB]$
```

Modify permissions so that only the group can write

Command:

```
sudo chmod 770 /projects/projectB
```

```
ls -ld /projects/projectB
```

Explanation: Sets read, write, and execute permissions for owner and group only.

Screenshot:

```
[ec2-user@ip-172-31-11-3 projectB]$  
[ec2-user@ip-172-31-11-3 projectB]$ sudo chmod 770 .  
[ec2-user@ip-172-31-11-3 projectB]$ ls -ld .  
drwxrwx---. 2 ec2-user developers 24 May 16 12:16 .  
[ec2-user@ip-172-31-11-3 projectB]$ |
```

Task 3: Changing File Ownership

Scenario: John is now the lead developer and should be the owner of projectB.

Change ownership of projectB to john

Command:

```
sudo chown john:developers /projects/projectB
```

Explanation: Changes the ownership of projectB to user 'john' and group 'developers'.

Screenshot:

```
drwxrwx---. 2 ec2-user developers 24 May 16 12:16 .  
[ec2-user@ip-172-31-11-3 projectB]$  
[ec2-user@ip-172-31-11-3 projectB]$ cd ..  
[ec2-user@ip-172-31-11-3 ~]$ sudo chown john:developers /home/ec2-user/projectB  
[ec2-user@ip-172-31-11-3 ~]$
```

Verify the ownership change

Command:

```
ls -ld /projects/projectB
```

Explanation: Lists detailed info about projectB to confirm the ownership change.

Screenshot:

```
[ec2-user@ip-172-31-11-3 ~]$  
[ec2-user@ip-172-31-11-3 ~]$ ls -ld /home/ec2-user/projectB  
drwxrwx---. 2 john developers 24 May 16 12:16 /home/ec2-user/projectB  
[ec2-user@ip-172-31-11-3 ~]$
```

Task 4: System-Level Monitoring Commands

Scenario: Your manager asks you to check system resource usage before installing a heavy application.

Check system uptime

Command:

uptime

Explanation: Displays how long the system has been running and the average system load.

Screenshot:

```
[ec2-user@ip-172-31-11-3 ~]$  
[ec2-user@ip-172-31-11-3 ~]$ uptime  
12:53:45 up 1:19, 3 users, load average: 0.00, 0.00, 0.00  
[ec2-user@ip-172-31-11-3 ~]$
```

Monitor disk usage

Command:

df -h

Explanation: Shows disk space usage in human-readable format.

Screenshot:

```
[ec2-user@ip-172-31-11-3 ~]$  
[ec2-user@ip-172-31-11-3 ~]$ df -h  
Filesystem      Size  Used Avail Use% Mounted on  
devtmpfs         4.0M    0  4.0M   0% /dev  
tmpfs            475M    0  475M   0% /dev/shm  
tmpfs            190M  460K  190M   1% /run  
/dev/xvda1       8.0G  1.6G   6.4G  20% /  
tmpfs            475M    0  475M   0% /tmp  
/dev/xvda128     10M  1.3M   8.7M  13% /boot/efi  
tmpfs            95M    0   95M   0% /run/user/1000  
[ec2-user@ip-172-31-11-3 ~]$
```

Check memory usage

Command:

free -m

Explanation: Displays memory usage in megabytes.

Screenshot:

```
[ec2-user@ip-172-31-11-3 ~]$  
[ec2-user@ip-172-31-11-3 ~]$ free -m  
              total        used        free      shared    buff/cache   available  
Mem:           949          121          588           0           239          690  
Swap:           0           0           0  
[ec2-user@ip-172-31-11-3 ~]$
```

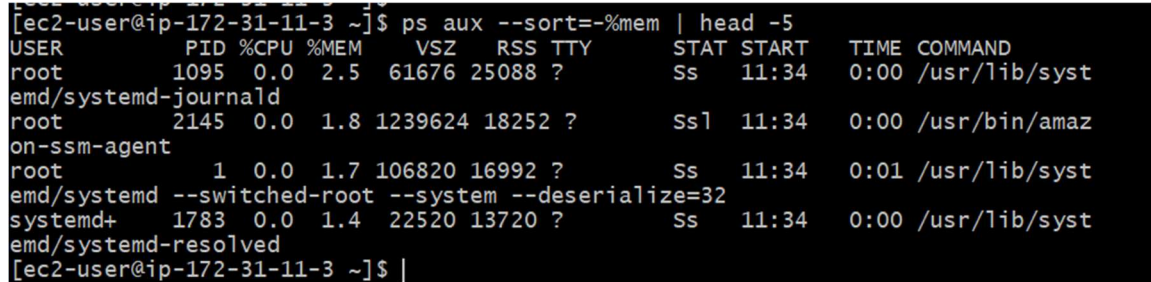
Monitor running processes

Command:

```
ps aux --sort=-%mem | head -5
```

Explanation: Shows top 5 memory-consuming processes.

Screenshot:



```
[ec2-user@ip-172-31-11-3 ~]$ ps aux --sort=-%mem | head -5
USER          PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root         1095  0.0   2.5  61676 25088 ?        Ss   11:34   0:00 /usr/lib/syst
emd/systemd-journald
root         2145  0.0   1.8 1239624 18252 ?        Ssl  11:34   0:00 /usr/bin/amaz
on-ssm-agent
root           1  0.0   1.7 106820 16992 ?        Ss   11:34   0:01 /usr/lib/syst
emd/systemd --switched-root --system --deserialize=32
systemd+    1783  0.0   1.4  22520 13720 ?        Ss   11:34   0:00 /usr/lib/syst
emd/systemd-resolved
[ec2-user@ip-172-31-11-3 ~]$ |
```