Week 2: Linux Fundamentals

Name: V. Risvanth

1. Project Directory Setup:

```
mkdir my_project
cd my_project
```

2. File Operations:

```
touch notes.txt
cp notes.txt backup_notes.txt
mkdir backup
mv backup_notes.txt backup/
```

3. Directory Removal:

```
rm -r backup
```

4. Script File Creation and Permissions:

```
touch script.sh
chmod 700 script.sh
```

5. Package Management:

```
sudo apt update
sudo apt install htop -y
htop –version
sudo apt remove htop -y
```

6. Process Management:

```
ps aux | grep sleep
kill <PID>
```

7. User and Group Management:

```
sudo adduser testuser
sudo usermod -aG sudo testuser
```

su – testuser

8. Shell Script Execution:

```
echo "Hello, World!" > hello.sh
chmod +x hello.sh
./hello.sh
```

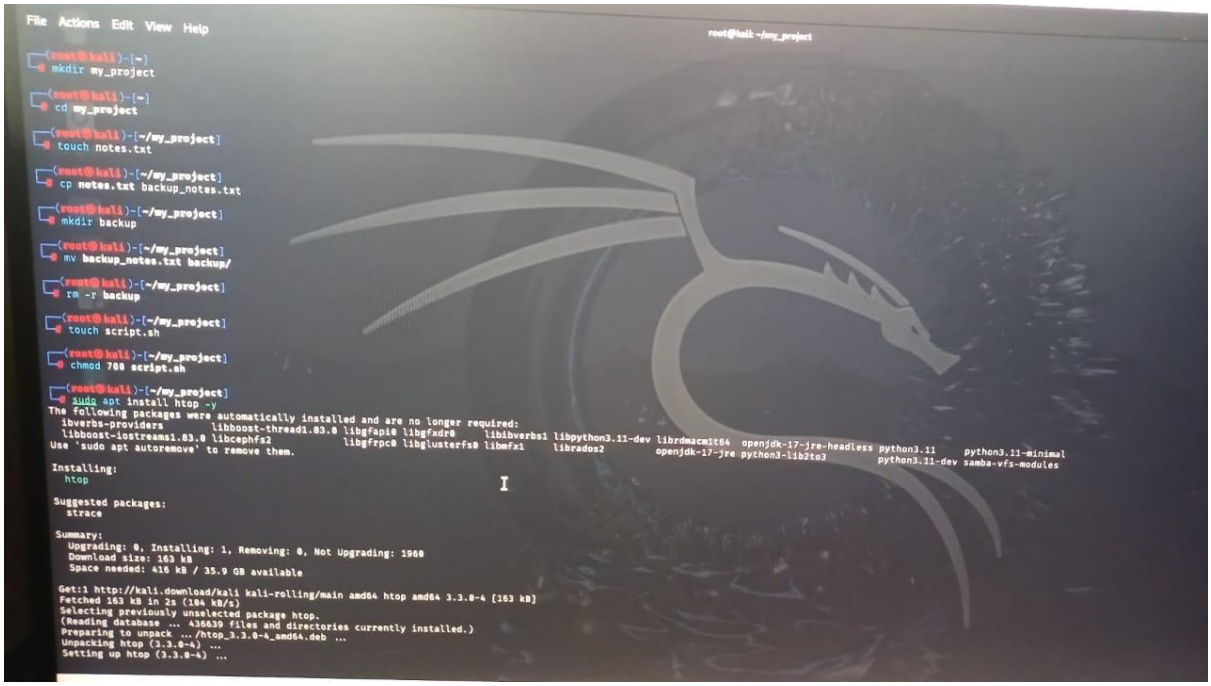
9. File Archiving and Compression:

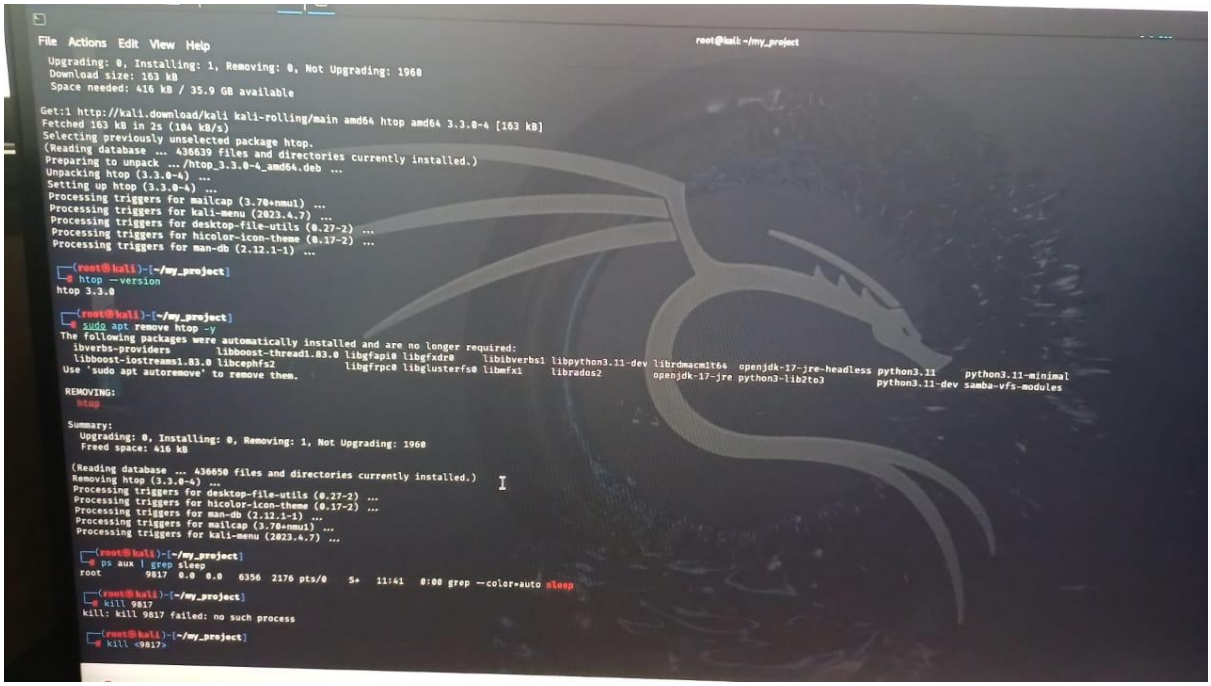
```
tar -cvf my_project.tar my_project/
tar -xvf my_project.tar
gzip my_project.tar
ls -l my_project.tar.gz
```

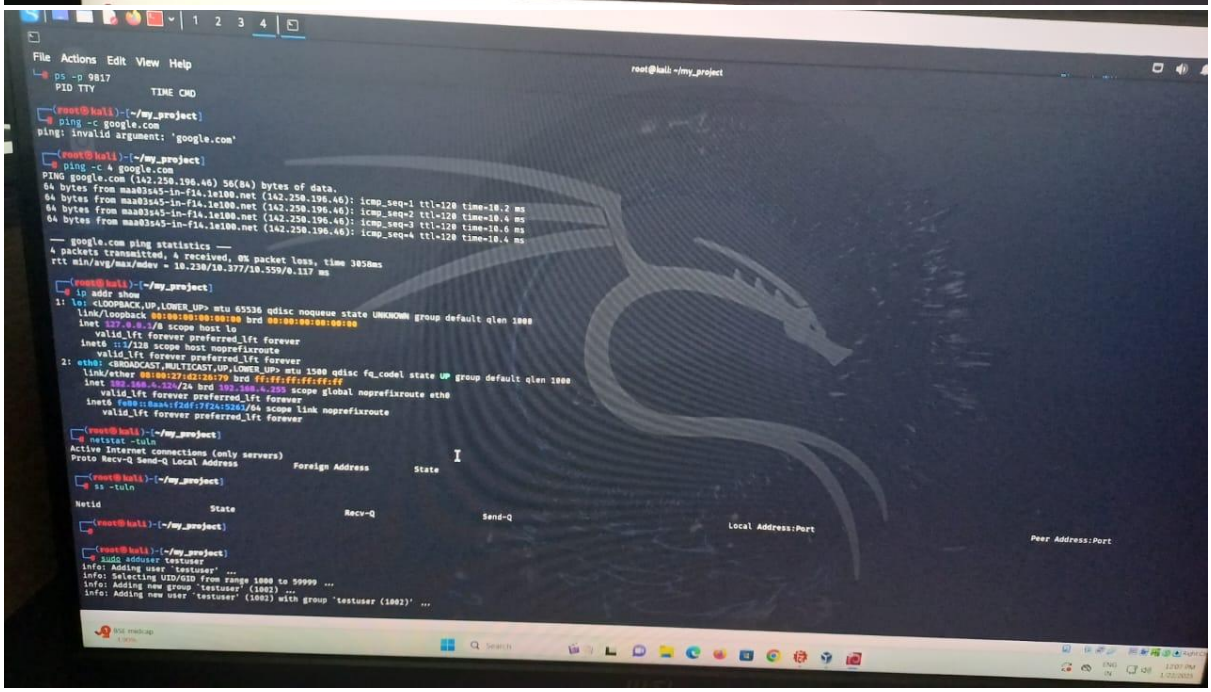
10. System Resource Monitoring:

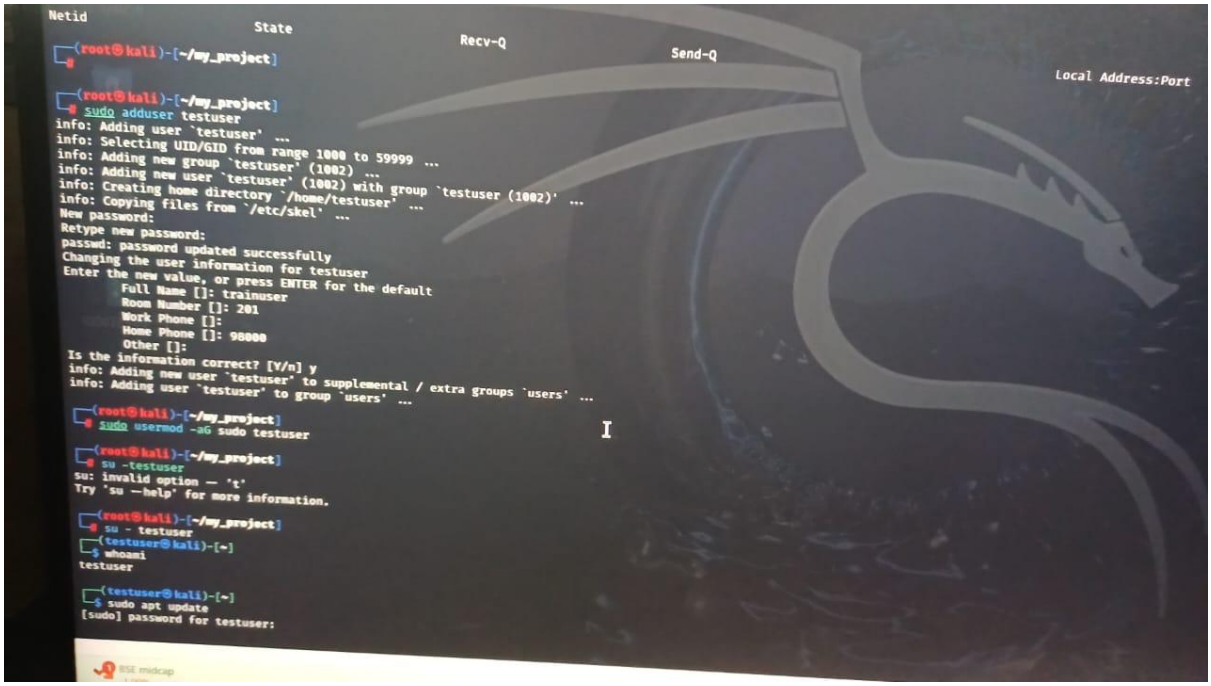
```
df -h
free -h
lscpu
```

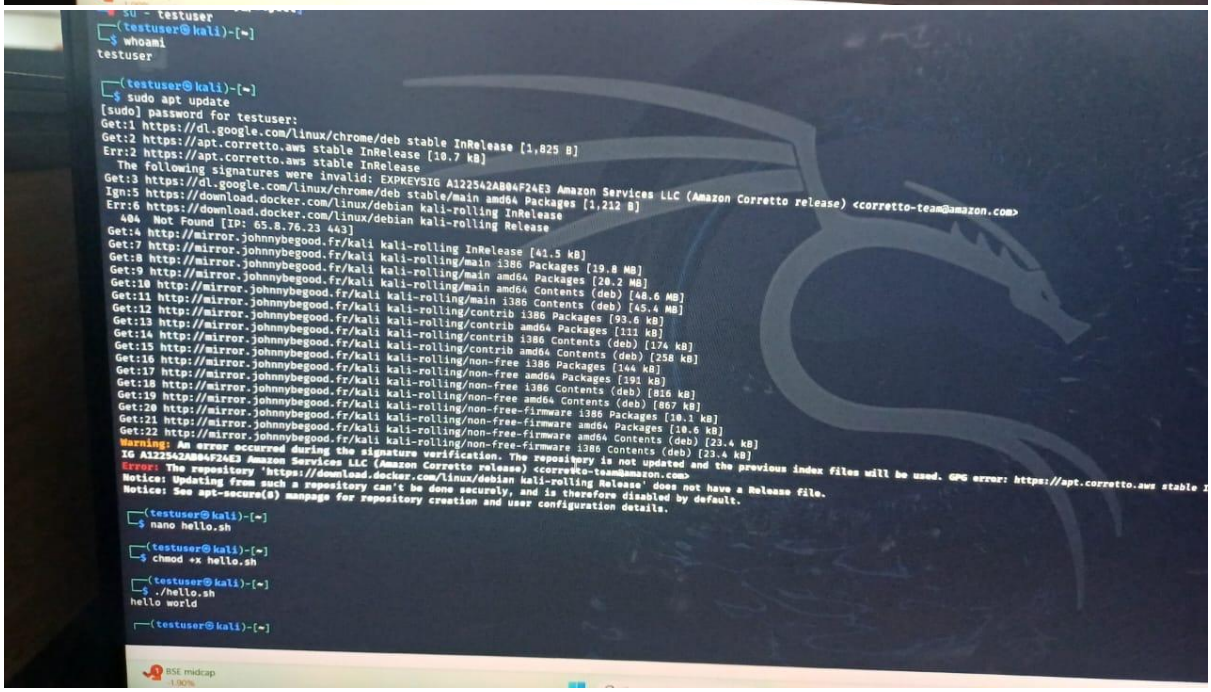
Output:



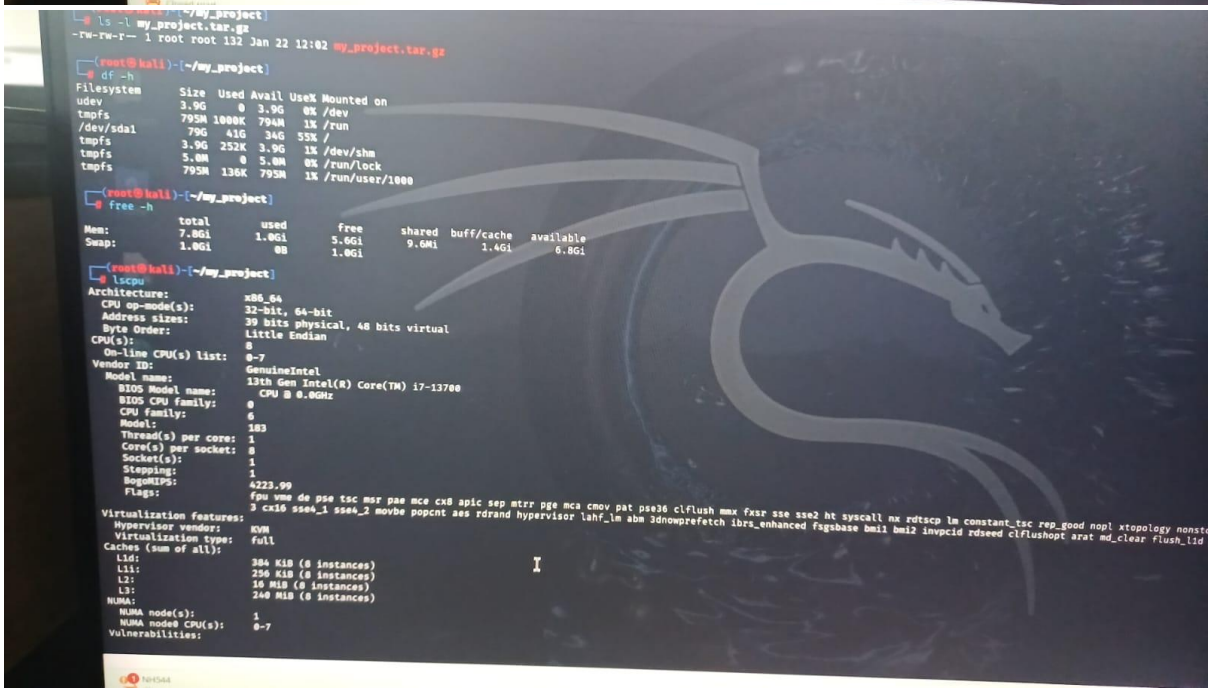

File Actions Edit View Help
root@kali: ~/my_project
Upgrading: 0, Installing: 1, Removing: 0, Not Upgrading: 1960
Download size: 163 kB
Space needed: 416 kB / 35.9 GB available
Get:1 http://kali.download/kali kali-rolling/main amd64 htop amd64 3.3.0-4 [163 kB]
Fetched 163 kB in 2s (104 kB/s)
Selecting previously unselected package htop.
(Reading database ... 436639 files and directories currently installed.)
Preparing to unpack .../htop_3.3.0-4_amd64.deb ...
Unpacking htop (3.3.0-4) ...
Setting up htop (3.3.0-4) ...
Processing triggers for mailcap (3.70+nmu1) ...
Processing triggers for kali-menu (2023.4.7) ...
Processing triggers for desktop-file-utils (0.27-2) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
Processing triggers for man-db (2.12.1-1) ...
htop 3.3.0
sudo apt remove htop -y
The following packages were automatically installed and are no longer required:
libverbs-providers libboost-thread1.83.0 libgfapi0 libgfxdr0 libibverbs1 libpython3.11-dev librdmacm1t64 openjdk-17-jre-headless python3.11 python3.11-minimal
libboost-iostreams1.83.0 libcephfs2 libgfrpc0 libglusterfs0 libmfx1 librados2 openjdk-17-jre python3-lib2to3 python3.11-dev samba-vfs-modules
Use 'sudo apt autoremove' to remove them.
REMOVING:
htop
Summary:
Upgrading: 0, Installing: 0, Removing: 1, Not Upgrading: 1960
Freed space: 416 kB
(Reading database ... 436650 files and directories currently installed.)
Removing htop (3.3.0-4) ...
Processing triggers for desktop-file-utils (0.27-2) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
Processing triggers for man-db (2.12.1-1) ...
Processing triggers for mailcap (3.70+nmu1) ...
Processing triggers for kali-menu (2023.4.7) ...
ps aux | grep sleep
root 9817 0.0 0.0 6356 2176 pts/0 S+ 11:41 0:00 grep --color=auto sleep
kill 9817
kill: kill 9817 failed: no such process
kill <9817>

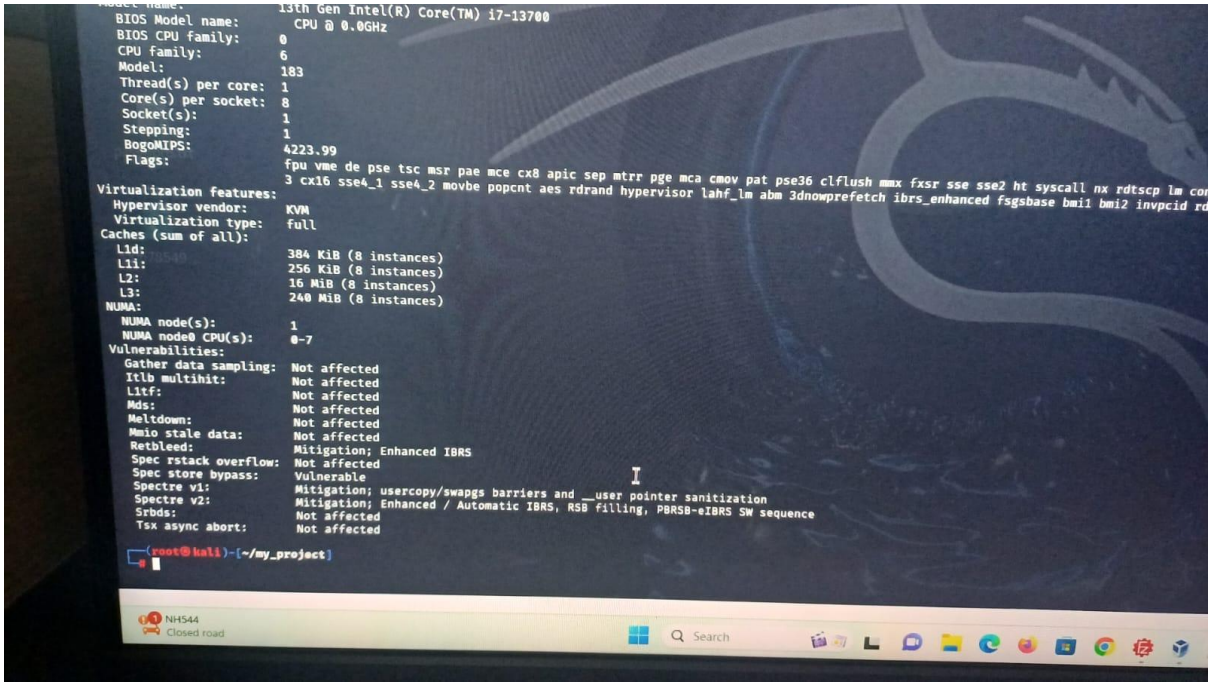

File Actions Edit View Help
root@kali: ~/my_project
ps -p 9817
PID TTY TIME CMD
ping -c google.com
ping: invalid argument: 'google.com'
ping -c 4 google.com
PING google.com (142.250.196.46) 56(84) bytes of data.
64 bytes from maa03s45-in-f14.1e100.net (142.250.196.46): icmp_seq=1 ttl=120 time=10.2 ms
64 bytes from maa03s45-in-f14.1e100.net (142.250.196.46): icmp_seq=2 ttl=120 time=10.4 ms
64 bytes from maa03s45-in-f14.1e100.net (142.250.196.46): icmp_seq=3 ttl=120 time=10.6 ms
64 bytes from maa03s45-in-f14.1e100.net (142.250.196.46): icmp_seq=4 ttl=120 time=10.4 ms
--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3058ms
rtt min/avg/max/mdev = 10.230/10.377/10.559/0.117 ms
ip addr show
netstat -tuln
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address Foreign Address State
ss -tuln
Netid State Recv-Q Send-Q Local Address:Port Peer Address:Port
sudo adduser testuser
info: Adding user `testuser' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group `testuser' (1002) ...
info: Adding new user `testuser' (1002) with group `testuser (1002)' ...


Netid State Recv-Q Send-Q Local Address:Port
(root㉿kali)-[~/my_project]
(root㉿kali)-[~/my_project]
sudo adduser testuser
info: Adding user `testuser' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group `testuser' (1002) ...
info: Adding new user `testuser' (1002) with group `testuser (1002)' ...
info: Creating home directory `/home/testuser' ...
info: Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for testuser
Enter the new value, or press ENTER for the default
Full Name []: trainuser
Room Number []: 201
Work Phone []:
Home Phone []: 98000
Other []:
Is the information correct? [Y/n] y
info: Adding new user `testuser' to supplemental / extra groups `users' ...
info: Adding user `testuser' to group `users' ...
(root㉿kali)-[~/my_project]
sudo usermod -aG sudo testuser
(root㉿kali)-[~/my_project]
su -testuser
su: invalid option — 't'
Try 'su —help' for more information.
(root㉿kali)-[~/my_project]
su - testuser
(testuser㉿kali)-[~]
$ whoami
testuser
(testuser㉿kali)-[~]
$ sudo apt update
[sudo] password for testuser:


su - testuser
(testuser㉿kali)-[~]
$ whoami
testuser
(testuser㉿kali)-[~]
$ sudo apt update
[sudo] password for testuser:
Get:1 https://dl.google.com/linux/chrome/deb stable InRelease [1,825 B]
Get:2 https://apt.corretto.aws stable InRelease [10.7 kB]
Err:2 https://apt.corretto.aws stable InRelease
The following signatures were invalid: EXPKEYSIG A122542AB04F24E3 Amazon Services LLC (Amazon Corretto release) <corretto-team@amazon.com>
Get:3 https://dl.google.com/linux/chrome/deb stable/main amd64 Packages [1,212 B]
Ign:5 https://download.docker.com/linux/debian kali-rolling InRelease
Err:6 https://download.docker.com/linux/debian kali-rolling Release
404 Not Found [IP: 65.8.76.23 443]
Get:4 http://mirror.johnnybegood.fr/kali kali-rolling InRelease [41.5 kB]
Get:7 http://mirror.johnnybegood.fr/kali kali-rolling/main i386 Packages [19.8 MB]
Get:8 http://mirror.johnnybegood.fr/kali kali-rolling/main amd64 Packages [20.2 MB]
Get:9 http://mirror.johnnybegood.fr/kali kali-rolling/main amd64 Contents (deb) [48.6 MB]
Get:10 http://mirror.johnnybegood.fr/kali kali-rolling/main i386 Contents (deb) [45.4 MB]
Get:11 http://mirror.johnnybegood.fr/kali kali-rolling/contrib i386 Packages [93.6 kB]
Get:12 http://mirror.johnnybegood.fr/kali kali-rolling/contrib amd64 Packages [111 kB]
Get:13 http://mirror.johnnybegood.fr/kali kali-rolling/contrib i386 Contents (deb) [174 kB]
Get:14 http://mirror.johnnybegood.fr/kali kali-rolling/contrib amd64 Contents (deb) [258 kB]
Get:15 http://mirror.johnnybegood.fr/kali kali-rolling/non-free i386 Packages [144 kB]
Get:16 http://mirror.johnnybegood.fr/kali kali-rolling/non-free amd64 Packages [191 kB]
Get:17 http://mirror.johnnybegood.fr/kali kali-rolling/non-free i386 Contents (deb) [816 kB]
Get:18 http://mirror.johnnybegood.fr/kali kali-rolling/non-free amd64 Contents (deb) [867 kB]
Get:19 http://mirror.johnnybegood.fr/kali kali-rolling/non-free-firmware i386 Packages [10.1 kB]
Get:20 http://mirror.johnnybegood.fr/kali kali-rolling/non-free-firmware amd64 Packages [10.6 kB]
Get:21 http://mirror.johnnybegood.fr/kali kali-rolling/non-free-firmware amd64 Contents (deb) [23.4 kB]
Get:22 http://mirror.johnnybegood.fr/kali kali-rolling/non-free-firmware i386 Contents (deb) [23.4 kB]
Warning: An error occurred during the signature verification. The repository is not updated and the previous index files will be used. GPG error: https://apt.corretto.aws stable I
IG A122542AB04F24E3 Amazon Services LLC (Amazon Corretto release) <corretto-team@amazon.com>
Error: The repository 'https://download.docker.com/linux/debian kali-rolling Release' does not have a Release file.
Notice: Updating from such a repository can't be done securely, and is therefore disabled by default.
Notice: See apt-secure(8) manpage for repository creation and user configuration details.
(testuser㉿kali)-[~]
$ nano hello.sh
(testuser㉿kali)-[~]
$ chmod +x hello.sh
(testuser㉿kali)-[~]
$ ./hello.sh
hello world
(testuser㉿kali)-[~]


(testuser㉿kali)-[~]
$ nano hello.sh
(testuser㉿kali)-[~]
$ chmod +x hello.sh
(testuser㉿kali)-[~]
$ ./hello.sh
hello world
(testuser㉿kali)-[~]
$ exit
logout
(root㉿kali)-[~/my_project]
tar -cvf my_project.tar my_project/
tar: my_project: Cannot stat: No such file or directory
tar: Exiting with failure status due to previous errors
(root㉿kali)-[~/my_project]
mkdir my_project
(root㉿kali)-[~/my_project]
tar -cvf my_project.tar my_project/
my_project/
(root㉿kali)-[~/my_project]
tar -xvf my_project.tar
my_project/
(root㉿kali)-[~/my_project]
gzip my_project.tar
(root㉿kali)-[~/my_project]
ls -l my_project.tar.gz
-rw-rw-r-- 1 root root 132 Jan 22 12:02 my_project.tar.gz
(root㉿kali)-[~/my_project]
df -h
Filesystem Size Used Avail Use% Mounted on
udev 3.9G 0 3.9G 0% /dev
tmpfs 795M 1000K 794M 1% /run
/dev/sda1 79G 41G 34G 55% /
tmpfs 3.9G 252K 3.9G 1% /dev/shm
tmpfs 5.0M 0 5.0M 0% /run/lock
tmpfs 795M 136K 795M 1% /run/user/1000
(root㉿kali)-[~/my_project]
free -h
total used free shared buff/cache available


-rw-rw-r-- 1 root root 132 Jan 22 12:02 my_project.tar.gz
(root㉿kali)-[~/my_project]
df -h
Filesystem Size Used Avail Use% Mounted on
udev 3.9G 0 3.9G 0% /dev
tmpfs 795M 1000K 794M 1% /run
/dev/sda1 79G 41G 34G 55% /
tmpfs 3.9G 252K 3.9G 1% /dev/shm
tmpfs 5.0M 0 5.0M 0% /run/lock
tmpfs 795M 136K 795M 1% /run/user/1000
(root㉿kali)-[~/my_project]
free -h
total used free shared buff/cache available
Mem: 7.8Gi 1.0Gi 5.6Gi 9.6Mi 1.4Gi 6.8Gi
Swap: 1.0Gi 0B 1.0Gi
(root㉿kali)-[~/my_project]
lscpu
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Address sizes: 39 bits physical, 48 bits virtual
Byte Order: Little Endian
CPU(s): 8
On-line CPU(s) list: 0-7
Vendor ID: GenuineIntel
Model name: 13th Gen Intel(R) Core(TM) i7-13700
BIOS Model name: CPU @ 0.0GHz
BIOS CPU family: 0
CPU family: 6
Model: 183
Thread(s) per core: 1
Core(s) per socket: 8
Socket(s): 1
Stepping: 1
BogoMIPS: 4223.99
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ht syscall nx rdtscp lm constant_tsc rep_good nopl xtopology nonst
3 cx16 sse4_1 sse4_2 movbe popcnt aes rdrand hypervisor lahf_lm abm 3dnowprefetch ibrs_enhanced fsgsbase bmi1 bmi2 invpcid rdseed clflushopt arat md_clear flush_l1d
Virtualization features:
Hypervisor vendor: KVM
Virtualization type: full
Caches (sum of all):
L1d: 384 KiB (8 instances)
L1i: 256 KiB (8 instances)
L2: 16 MiB (8 instances)
L3: 240 MiB (8 instances)
NUMA:
NUMA node(s): 1
NUMA node0 CPU(s): 0-7
Vulnerabilities:



Conclusion:

This week involved learning and applying various essential Linux commands, such as file creation, file manipulation, directory management, process handling, package management, and system monitoring.
