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CSIT 460-03

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<div align="center">Lab 1</div>

1.

The commands "passwd", "chsh" , "su", and "sudo" need to be in Set-UID programs because they are only writable by root. Without the specific Set-UID, the access to read, modify, or execute would fail due to lack of root privilege. This is shown when copying the location of the commands to tmp (temporary). After running the command, the root privileges previously seen are now replaced with seed.

```
[09/26/23]seed@VM:~$ ls -l /usr/bin/passwd
-rwsr-xr-x 1 root root 68208 May 28  2020 /usr/bin/passwd
[09/26/23]seed@VM:~$ cp /usr/bin/passwd /tmp/
[09/26/23]seed@VM:~$ ls -l /tmp/passwd
-rwxr-xr-x 1 seed seed 68208 Sep 26 21:49 /tmp/passwd
[09/26/23]seed@VM:~$
```

```
[09/26/23]seed@VM:~$ which chsh
/usr/bin/chsh
[09/26/23]seed@VM:~$ ls -l /usr/bin/chsh
-rwsr-xr-x 1 root root 53040 May 28  2020 /usr/bin/chsh
[09/26/23]seed@VM:~$ cp /usr/bin/chsh /tmp/
[09/26/23]seed@VM:~$ ls -l /tmp/chsh
-rwxr-xr-x 1 seed seed 53040 Sep 26 21:53 /tmp/chsh
[09/26/23]seed@VM:~$
```

```
[09/26/23]seed@VM:~$ which su
/usr/bin/su
[09/26/23]seed@VM:~$ ls -l /usr/bin/su
-rwsr-xr-x 1 root root 67816 Jul 21  2020 /usr/bin/su
[09/26/23]seed@VM:~$ cp /usr/bin/su /tmp/
[09/26/23]seed@VM:~$ ls -l /tmp/su
-rwxr-xr-x 1 seed seed 67816 Sep 26 21:57 /tmp/su
[09/26/23]seed@VM:~$
```

```
[09/26/23]seed@VM:~$ ls -l /usr/bin/sudo
-rwsr-xr-x 1 root root 166056 Jul 14  2020 /usr/bin/sudo
[09/26/23]seed@VM:~$ cp /usr/bin/sudo /tmp/
[09/26/23]seed@VM:~$ ls -l /tmp/sudo
-rwxr-xr-x 1 seed seed 166056 Sep 26 21:59 /tmp/sudo
[09/26/23]seed@VM:~$ █
```

2.

a)

```
root@VM:/home/seed# sudo su
root@VM:/home/seed# cp /bin/zsh /tmp
root@VM:/home/seed# chmod 4755 /tmp/zsh
root@VM:/home/seed# ls -al /tmp/zsh
-rwsr-xr-x 1 root root 878288 Sep 26 21:34 /tmp/zsh
root@VM:/home/seed# █
```

Within this program, the root permission is applied to zsh

b)

```
root@VM:/home/seed# sudo su
root@VM:/home/seed# cp /bin/bash /tmp
root@VM:/home/seed# chmod 4755 /tmp/bash
root@VM:/home/seed# ls -al /tmp/bash
-rwsr-xr-x 1 root root 1183448 Sep 26 21:40 /tmp/bash
root@VM:/home/seed# □
```

The program does get root privilege but it is instead applied to bash instead of zsh

3.

```
[09/26/23]seed@VM:~$ sudo su
root@VM:/home/seed# cd /bin
root@VM:/bin# rm sh
root@VM:/bin# ln -s zsh sh
root@VM:/bin# ls -al sh
lrwxrwxrwx 1 root root 3 Sep 26 17:42 sh -> zsh
root@VM:/bin# □
```

4.

a and b)

I had trouble with this question and couldn't figure out how to run the code or add a new directory.

```
[09/26/23]seed@VM:~$ sudo su
root@VM:/home/seed# cd /tmp/
root@VM:/tmp# exit
exit
[09/26/23]seed@VM:~$ echo $PATH
/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/snap/bin
:.
[09/26/23]seed@VM:~$ sudo su
root@VM:/home/seed# cd /tmp/
```