1.3 Lab Exercises

Exercise 1: Using the ls command, list all the files and directories in the current directory.

Exercise 2: Create a new directory named **lab_files**. Navigate into this directory and create a new file named **example.txt**.

Exercise 3: Use the **cp** command to make a copy of **example.txt** and name it **example_backup.txt**.

Exercise 4: Remove the file **example.txt** from the **lab_files** directory.

Exercise 5: Use the **mkdir** command to create three new directories named **folder1**, **folder2**, and **folder3** within **lab_files**.

Exercise 6: Explain the purpose of the **/etc** directory in the Linux file system.

Exercise 7: Identify and list the contents of the **/usr** directory.

Exercise 8: Investigate the contents of the **/bin** and **/sbin** directories and explain their significance.

Solution:

Solution 1:
```
xanderbilla@XANDER:~$ ls /
bin    dev   home   lib     lib64    lost+found   mnt   proc   run    snap   sys   usr
boot   etc   init   lib32   libx32   media              opt   root   sbin   srv   tmp   var
```

Solution 2:
```
xanderbilla@XANDER:~$ mkdir lab_files
xanderbilla@XANDER:~$ ls
lab_files
xanderbilla@XANDER:~$ cd lab_files/
xanderbilla@XANDER:~/lab_files$ touch example.txt
xanderbilla@XANDER:~/lab_files$ ls
example.txt
xanderbilla@XANDER:~/lab_files$
xanderbilla@XANDER:~/lab_files$ echo "CSE 325 | Your text here" > example.txt
xanderbilla@XANDER:~/lab_files$ cat example.txt
CSE 325 | Your text here
xanderbilla@XANDER:~/lab_files$ 
```

Solution 3:

```
xanderbilla@XANDER:~/lab files$ ls
example.txt
xanderbilla@XANDER:~/lab files$ cp example.txt example_backup.txt
xanderbilla@XANDER:~/lab files$ ls
example.txt   example_backup.txt
xanderbilla@XANDER:~/lab files$ █
```

Solution 4:

```
xanderbilla@XANDER:~/lab_files$ ls
example.txt
xanderbilla@XANDER:~/lab_files$ cp example.txt example_backup.txt
xanderbilla@XANDER:~/lab_files$ ls
example.txt   example_backup.txt
xanderbilla@XANDER:~/lab_files$ █
```

Solution 5:

```
xanderbilla@XANDER:~/lab_files$ ls
example.txt   example_backup.txt
xanderbilla@XANDER:~/lab_files$ mkdir folder1 folder2 folder3
xanderbilla@XANDER:~/lab_files$ ls
example.txt   example_backup.txt   folder1   folder2   folder3
xanderbilla@XANDER:~/lab_files$ █
```

Solution 6:
- The `/etc` directory is a central repository for configuration files in Unix-like systems.
- It contains essential settings for system behavior, user authentication, and network configuration.
- Example configurations include Apache web server settings (`/etc/apache2/httpd.conf`), package manager repositories (`/etc/apt/sources.list`), and firewall rules (`/etc/iptables/`).
- It serves as a control center for customizing and managing system-wide configurations, making it vital for system administration and customization.

Solution 7:

```
xanderbilla@XANDER:~$ ls /
bin    dev   home   lib     lib64   lost+found   mnt   proc   run    snap   sys   usr
boot   etc   init   lib32   libx32  media              opt    root   sbin   srv   tmp   var
xanderbilla@XANDER:~$ ls /usr/
bin   games   include   lib   lib32   lib64   libexec   libx32   local   sbin   share   src
xanderbilla@XANDER:~$
```

Solution 8:

`/bin`

- The **/bin** directory is a core component of Unix-like systems, containing essential binary executables.
- These binaries are primarily user-level commands necessary for basic system operations and interactions.
- Examples of commands stored in **/bin** include ls for listing directory contents, **cp** for copying files, rm for removing files, **mkdir** for creating directories, **cat** for displaying file contents, and **chmod** for changing file permissions.
- **/bin** binaries are typically accessible to all users and are integral to performing common tasks within the command-line interface.
- The separation of essential binaries into **/bin** ensures their availability regardless of the system's state, facilitating system maintenance and troubleshooting.
- Administrators often rely on the binaries in **/bin** for scripting tasks, system automation, and user operations due to their ubiquity and reliability.

`/sbin`

- **/sbin** is a directory in Unix-like systems for storing system administration binaries, often containing commands used by the root user for system maintenance and management.
- It typically holds executables related to system startup, shutdown, and repair, as well as essential system-level administrative tasks.
- Example binaries found in **/sbin** include utilities for managing disks (**/sbin/fsck** for filesystem checking and repair, /sbin/fdisk for disk partitioning), network configuration (**/sbin/ifconfig** for network interface configuration, **/sbin/route** for managing routing tables), and system startup**/shutdown** (**/sbin/shutdown** for shutting down or rebooting the system).
- **/sbin** binaries are usually vital for system integrity and are often restricted to administrative use, requiring root privileges to execute.
- These binaries are distinct from those in **/bin**, which contain essential user-level commands, as **/sbin** contains executables primarily for system administration tasks.

- Due to the critical nature of the binaries stored in **/sbin**, it is not typically included in the default PATH for regular users, ensuring that they are not accidentally executed without proper authorization.