1. Explain what the following commands do (with examples):

- **lockfile:** This command is used to create lock files, which can be used to synchronize access to a file or resource.
  e.g. lockfile myfile.lock (this will create lockfile named myfile)
- **cksum:** This command calculates a checksum value for a file, which can be used to verify file integrity.
  e.g. $ cksum doc.txt (this command will calculate the checksum for file named doc It will then display the checksum value along with the byte count and the file name. For example, the command might output something like this: 123456789 1000 doc.txt)
- **comm:** This command compares two sorted files line by line and displays the lines that are common or unique to each file.
  e.g. comm myfile.txt yourfile.txt (this command will compare myfile.txt with yourfile.txt)
- **csplit:** This command is used to split a file into multiple smaller files based on specific criteria.
  Suppose you have a file named xyz.txt, and you want to split it into separate files whenever a line matching a specific pattern occurs. Let's say the pattern you're looking for is the string "??? CEW???".
  e.g. csplit xyz.txt '/???CEW???' '{*
- **chattr:** This command is used to change the file attributes, such as making a file immutable or undeletable.
  You can use the chattr command with the +i option to make the file immutable,
  e.g. chattr +i data.txt
- **touch:** This command is used to update the access and modification timestamps of a file, or create a new file if it doesn't exist.
  e.g. touch CEW.txt

2. What do the following do:

- **cat ch1**
  It displays the contents of the file named ch1.
- **cat ch1 ch2 ch3 > "G-1"**
  This command will combine the contents of the three files ch1, ch2, and ch3 and save them into a new file called "G-1".
- **cat note5 >> notes**
  This command will append (means content will be added at the end of the notes file without overwriting any existing content) the content of file named note5 to the file named notes.
- **cat > temp1**
  This command will create a new file named temp1. This command allows to enter text directly into the file. After running the command, we can start typing the content we want to add to temp1. Press Ctrl + D when we're done to save and exit the file.
- **cat > temp2 << "Malaika"**
  This command allows you to enter content interactively and saves it to the file temp2. However, it uses a here-document (<<) with the delimiter set as "Malaika". This means that you can enter multiple lines of

text until you type the delimiter (in this case, "Malaika"), and then press Enter. The entered content will be saved to the file temp2.

3. Practice the following commands and explain each:

- **cpio:** The cpio command is used to create and extract archives. It stands for "copy in, copy out" and is commonly used for creating backups or transferring files between systems. It can work with various archive formats such as cpio, tar, and pax.
- **sort:** The sort command is used to sort lines of text in a file or standard input. It arranges the lines in either ascending or descending order based on the specified criteria, such as alphabetical order or numerical order.
- **fuser:** The fuser command is used to identify processes that are currently using a file, directory, or socket. It can be helpful in troubleshooting scenarios to determine which processes are accessing a particular resource.
- **file:** The file command is used to determine the type of a file. It examines the contents of a file and provides information about its format or encoding. This command is often used to identify the file type when the file extension is not sufficient.

4. What does the z option of the tar command do? Explain with examples.

The -z option in the tar command is used to compress or decompress files using gzip compression. When creating an archive, the -z option tells tar to compress the files using gzip. When extracting files from an archive, the -z option tells tar to decompress the files using gzip. Here are a couple of examples to illustrate the usage of the -z option:

- ✓ **Compressing files:**
  tar -czf archive.tar.gz file1.txt file2.txt
  This command creates a compressed archive named archive.tar.gz that contains file1.txt and file2.txt. The -c option tells tar to create an archive, the -z option tells it to compress using gzip, the -v option enables verbose output, and the -f option specifies the name of the archive file.
- ✓ **Extracting files:**
  Tar -xzf archive.tar.gz
  This command extracts the files from the compressed archive archive.tar.gz. The -x option tells tar to extract files, the -z option tells it to decompress using gzip, the -v option enables verbose output, and the -f option specifies the name of the archive file.

5. Differentiate between cp and cpio command.

The cp and cpio commands are both used for copying files, but they have some differences in functionality and usage.

The cp command is used to copy files and directories from one location to another. It can copy individual files, multiple files, or entire directories. The basic syntax of the cp command is cp [options] source destination.

E.g. cp file1.txt /path/to/destination will copy file1.txt to the /path/to/destination directory.

On the other hand, the cpio command is primarily used for creating and extracting archives. It can work with various archive formats such as cpio, tar, and pax. The cpio command reads a list of files from the standard input or a file and creates an archive containing those files. It can also extract files from an archive. The basic syntax of the cpio command is cpio [options].

For example, cpio -o > archive.cpio will create a cpio archive from the files listed in the standard input.In short, while both commands can be used to copy files, the cp command is more commonly used for simple file and directory copying, while the cpio command is used for creating and extracting archives.

6. **Write two commands to take the backup of your home-folder and all sub-folders. The destination folder should be /home/bkup. (**NOTE: size of backup should be smaller than original folder).

   tar -cvf /home/bkup/home_backup.tar /home/Malaika

   This command will create an uncompressed backup file named home_backup.tar in the /home/bkup directory. It will also include your entire home folder and all its sub-folders.

7. **What is the difference between the permissions 777 and 775 of the chmod command?**

The chmod command is used to change the permissions of files and directories. The permissions are represented by three digits: the first digit represents the owner's permissions, the second digit represents the group's permissions, and the third digit represents the permissions for others.

In the context of the chmod command, the numbers 777 and 775 represent different permission settings.

- ✓ 777 means that the owner, group, and others have all permissions: read, write, and execute. This is the most permissive setting, as it allows anyone to read, modify, and execute the file or directory.

- ✓ 775 means that the owner has all permissions, the group has read, write, and execute permissions, and others have read and execute permissions. This setting is more restrictive than 777, as it does not allow others to modify the file or directory.