UNIT-1

Introduction to UNIX UNIX operating system, UNIX architecture: Kernel and Shell, Files and Processes, System calls, Features of UNIX, POSIX and single user specification, Internal and external commands Utilities of UNIX Calendar (cal), Display system date (date), Message display (echo), Calculator (bc), Password changing (password), Knowing who are logged in (who), Systeminformation using uname, File name of terminal connected to the standard input (tty)

The kernel in the UNIX operating system acts as the core component responsible for managing system resources, such as memory, CPU, devices, and file systems. It provides essential services to applications and handles tasks like process management, memory allocation, and device I/O.

The shell in UNIX is a command-line interpreter that acts as the interface between the user and the operating system kernel. It interprets user commands and executes them by interacting with the kernel. The shell provides features such as command execution, input/output redirection, piping, and scripting capabilities.

The architecture of the UNIX operating system consists of two main components: the kernel and the shell. The kernel is the core of the operating system responsible for managing hardware resources and providing essential services to applications. The shell is the user interface that allows users to interact with the system and execute commands. The shell communicates with the kernel to perform tasks requested by users.

Files in UNIX are persistent data objects stored on a disk or other storage media. Processes are instances of executing programs managed by the operating system. UNIX manages files and processes using a hierarchical file system and process control mechanisms, respectively.

System calls in UNIX are programming interfaces provided by the kernel that allow applications to request services from the operating system. Examples of common system calls include fork() for creating new processes, open() for opening files, and read() for reading data from files.

The key features of UNIX include multi-user and multi-tasking capabilities, a hierarchical file system, a shell-based interface, portability across different hardware platforms, and a rich set of utilities and commands for system administration and programming.

POSIX (Portable Operating System Interface) is a set of standards specifying the application programming interface (API) for UNIX-like operating systems. It ensures compatibility and interoperability between different UNIX systems and allows developers to write portable code that can run on various UNIX platforms.

Internal commands in UNIX are built-in commands provided by the shell itself, while external commands are standalone programs located in directories specified in the PATH environment variable. Examples of internal commands include cd (change directory) and pwd (print

working directory), while examples of external commands include ls (list directory contents) and cp (copy files).

The 'cal' command in UNIX is used to display a calendar for a specific month or year.

For example, 'cal 2 2022' displays the calendar for February 2022.

The 'date' command in UNIX is used to display the current system date and time.

Simply typing 'date' in the command prompt will display the current date and time.

The 'echo' command in UNIX is used to display a line of text or a variable value.

For example, 'echo Hello, world!' will output 'Hello, world!' to the terminal.

The 'bc' command in UNIX is used as a calculator for performing arithmetic calculations.

For example, 'echo "5 + 3" | bc' will output '8' to the terminal.

The 'password' command in UNIX is used to change a user's password. Typing 'password' at the command prompt will prompt the user to enter their current password and then enter a new password.

The 'who' command in UNIX is used to display a list of users currently logged into the system.

Typing 'who' at the command prompt will display a list of usernames along with information about their login sessions.

The 'uname' command in UNIX is used to retrieve system information such as the operating system name, version, and hardware platform.

Typing 'uname -a' at the command prompt will display detailed system information.

The 'tty' command in UNIX is used to print the file name of the terminal connected to the standard input.

Typing 'tty' at the command prompt will display the file name of the terminal being used for input.

Unit-1 Question Lab.

1. **What command would you use to display the calendar for the month of February 2022?**
2. **How can you find out the current system date and time in UNIX?**
3. **Which command would you use to display the message "Hello, world!" in the terminal?**
4. **If you need to perform a calculation such as adding 5 and 3, what command would you use?**
5. **Suppose you want to change your password in UNIX. What command would you use for this task?**
6. **How can you determine who is currently logged into the system?**
7. **What command would you use to retrieve system information such as the operating system name and version?**
8. **If you want to know the file name of the terminal connected to the standard input, what command would you use?**
9. **Which command would you use to list the contents of a directory in UNIX?**
10. **How can you display the file permissions of a specific file in UNIX?**

11. **Suppose you want to copy a file named "example.txt" to another directory. What command would you use?**
12. **How can you create a new directory named "documents" in UNIX?**
13. **If you need to move a file named "report.txt" to another directory, what command would you use?**
14. **What command would you use to remove a file named "temp.txt" from the filesystem?**
15. **How can you display the contents of a text file named "sample.txt" in the terminal?**
16. **Suppose you want to search for a specific word in a text file named "document.txt". What command would you use for this task?**

Unit-2 Question Lab.

1. How can you display the pathname of the current directory in UNIX?
2. How do you change the current directory in UNIX?
3. How can you create a new directory in UNIX?
4. How do you remove a directory in UNIX?
5. What is an inode number in UNIX, and how can you find it for a file?
6.

Unit-1 Lab Answers.

1. **To display the calendar for the month of February 2022, you would use the command:**
   cal 2 2022.

2. **You can find out the current system date and time in UNIX by using the command:**
   date.

3. **To display the message "Hello, world!" in the terminal, you would use the command:**
   echo "Hello, world!".

4. If you need to perform a calculation such as adding 5 and 3, you would use the command:
   echo "5 + 3" | bc.

5. To change your password in UNIX, you would use the command:
   passwd.

6. You can determine who is currently logged into the system by using the command:
   who.

7. To retrieve system information such as the operating system name and version, you would use the command:
   uname -a.

8. If you want to know the file name of the terminal connected to the standard input, you would use the command:

tty.

9. **To list the contents of a directory in UNIX, you would use the command:**
   ls.

10. **You can display the file permissions of a specific file in UNIX by using the command:**
    ls -l filename.

11. **If you want to copy a file named "example.txt" to another directory, you would use the command:**
    cp example.txt /path/to/destination.

12. **To create a new directory named "documents" in UNIX, you would use the command:**

    mkdir documents.

13. If you need to move a file named "report.txt" to another directory, you would use the command: mv report.txt /path/to/destination.

14. To remove a file named "temp.txt" from the filesystem, you would use the command:

    rm temp.txt.

15. You can display the contents of a text file named "sample.txt" in the terminal by using the command:
    cat sample.txt.

16. If you want to search for a specific word in a text file named "document.txt", you would use the command:
    grep "word" document.txt.