

VIDHI ROHIRA  
SY BTECH

COMPUTER  
ENGINEERING

OST LAB  
231071052

# EXPERIMENT 1

**AIM:-** Introduction to open source technology, internet, open source operating systems and open source platforms.

## **THEORY:-**

### **Q1] What is Open Source?**

Open source refers to software that is released with its source code made available to the public. This means anyone can inspect, modify, and distribute the code. Open source promotes collaboration and transparency, allowing developers to improve and innovate on the software.

Here are some key aspects of open source:

1. **Accessibility:** The source code is freely accessible, so anyone can view how the software works and make changes if desired.
2. **Licensing:** Open source software is distributed under licenses that specify how it can be used, modified, and shared. Examples of open source licenses include the GNU General Public License (GPL), the MIT License, and the Apache License.
3. **Community Collaboration:** Open source projects often have a community of contributors who work together to improve the software. Contributions can range from code updates to documentation and bug reports.
4. **Transparency:** With the source code available, users can understand exactly what the software does, which can enhance security and trust.
5. **Flexibility:** Users and developers can customize open source software to meet their specific needs, whether for personal, educational, or commercial purposes.

Popular examples of open source software include the Linux operating system, the Apache HTTP Server, and the Mozilla Firefox web browser.

## Q2] What is the use of Internet in Open Source?

The internet is essential for the open source ecosystem, supporting projects through:

1. **Code Hosting and Distribution:** Platforms like GitHub and GitLab host and share code, while users can easily download software from various sources.
2. **Collaboration and Contribution:** Tools like forums, chat platforms, and Git-based services enable discussion, issue tracking, and code contributions.
3. **Documentation and Learning:** Online documentation and tutorials help users learn and contribute to projects.
4. **Community Building:** Social media and online events foster community engagement and networking.
5. **Security and Updates:** The internet facilitates rapid vulnerability reporting, automated testing, and continuous integration.
6. **Licensing and Compliance:** It provides access to licensing information and compliance tools.

Overall, the internet enables global collaboration and growth for open source projects.

## Q3] What are the tools used in Open Source?

### Code Hosting and Version Control

- **Git:** Distributed version control system.
- **GitHub/GitLab/Bitbucket:** Platforms for hosting repositories, collaboration, and code reviews.

### Code Editors and IDEs

- **VS Code/Atom/Sublime Text:** Popular code editors.
- **Eclipse:** IDE for Java and other languages.

## Collaboration and Communication

- **Slack/Discord/Matrix:** Messaging and communication platforms.
- **Mailing Lists:** For announcements and discussions.

## Documentation and Wiki

- **Read the Docs/Docusaurus/MkDocs:** Tools for creating and managing documentation.

## CI/CD

- **Jenkins/Travis CI/CircleCI:** Tools for automating testing and deployment.
- **GitLab CI/CD:** Integrated CI/CD with GitLab.

## Q4] What are the open source operating systems ?

### Linux Distributions

- **Ubuntu:** User-friendly, widely used.
- **Fedora:** Cutting-edge features.
- **Debian:** Stable and versatile.
- **CentOS:** Community build of RHEL.
- **Arch Linux:** Minimal and rolling-release.
- **openSUSE:** Enterprise-grade stability.
- **Manjaro:** User-friendly Arch-based.

### Unix-like Systems

- **FreeBSD:** Advanced networking and security.
- **OpenBSD:** Security-focused.
- **NetBSD:** Highly portable.

### Other

- **Haiku:** BeOS recreation.
- **ReactOS:** Windows compatibility

## Q5] Why Git is called as version control?

Git is called a version control system because it tracks and manages changes to files, allowing users to:

- **Track Changes:** Record and view file modifications over time.
- **Revert Changes:** Roll back to previous versions if needed.
- **Branch and Merge:** Develop features independently and merge them later.
- **Collaborate:** Enable multiple people to work on the same project without conflicts.
- **Maintain History:** Keep a detailed history of changes.

## Q6] What is the difference between open source and closed source?

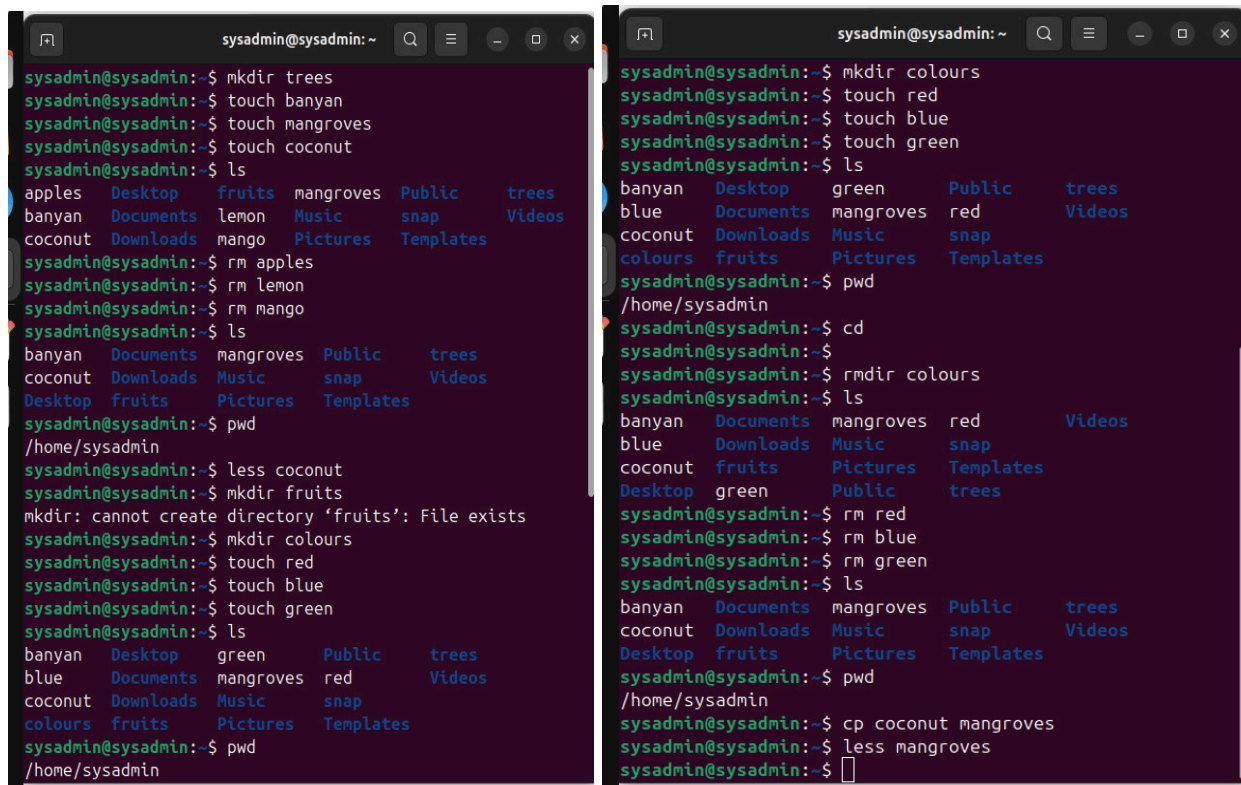
S.No	Open Source	Closed Source
1.	It is customizable depending on the software's license.	Any change in this software request must be made to the authorized company.
2.	It is available for zero licensing and usage charges.	The cost of this software varies depending on its scale.
3.	The user-friendliness depends on the projects and the community maintaining them.	As this software is made for profit purposes by the organization, they are usually more User-friendly.
4.	As many users continuously analyze the open-source software, it is easy to detect the bugs and rectify them.	The service company is responsible for the security-related issues, detecting the errors, and fixing them.
5.	The idea of open-source is to involve various users to enhance the performance features and Development process.	No such community is engaged in the development of such software.

# LINUX COMMANDS:-

Linux commands are text-based instructions used to perform tasks and manage various aspects of a Linux operating system. These commands are executed in a terminal or command-line interface (CLI) and enable users to interact with the system to:

- **Manage Files and Directories:** Create, delete, move, and modify files and directories.
- **Control Processes:** Start, stop, and monitor running processes.
- **Configure System Settings:** Adjust system configurations and manage hardware resources.
- **Perform System Maintenance:** Check disk usage, memory, and other system health metrics.
- **Access Network Resources:** Connect to and manage network services.

## Screenshots and explanation of lab work:-



```
sysadmin@sysadmin: ~  
sysadmin@sysadmin:~$ mkdir trees  
sysadmin@sysadmin:~$ touch banyan  
sysadmin@sysadmin:~$ touch mangroves  
sysadmin@sysadmin:~$ touch coconut  
sysadmin@sysadmin:~$ ls  
apples Desktop fruits mangroves Public trees  
banyan Documents lemon Music snap Videos  
coconut Downloads mango Pictures Templates  
sysadmin@sysadmin:~$ rm apples  
sysadmin@sysadmin:~$ rm lemon  
sysadmin@sysadmin:~$ rm mango  
sysadmin@sysadmin:~$ ls  
banyan Documents mangroves Public trees  
coconut Downloads Music snap Videos  
Desktop fruits Pictures Templates  
sysadmin@sysadmin:~$ pwd  
/home/sysadmin  
sysadmin@sysadmin:~$ less coconut  
sysadmin@sysadmin:~$ mkdir fruits  
mkdir: cannot create directory 'fruits': File exists  
sysadmin@sysadmin:~$ mkdir colours  
sysadmin@sysadmin:~$ touch red  
sysadmin@sysadmin:~$ touch blue  
sysadmin@sysadmin:~$ touch green  
sysadmin@sysadmin:~$ ls  
banyan Desktop green Public trees  
blue Documents mangroves red Videos  
coconut Downloads Music snap  
colours fruits Pictures Templates  
sysadmin@sysadmin:~$ pwd  
/home/sysadmin  
sysadmin@sysadmin:~$ cd  
sysadmin@sysadmin:~$ rmdir colours  
sysadmin@sysadmin:~$ ls  
banyan Documents mangroves red Videos  
blue Downloads Music snap  
coconut fruits Pictures Templates  
Desktop green Public trees  
sysadmin@sysadmin:~$ rm red  
sysadmin@sysadmin:~$ rm blue  
sysadmin@sysadmin:~$ rm green  
sysadmin@sysadmin:~$ ls  
banyan Documents mangroves Public trees  
coconut Downloads Music snap Videos  
Desktop fruits Pictures Templates  
sysadmin@sysadmin:~$ pwd  
/home/sysadmin  
sysadmin@sysadmin:~$ cp coconut mangroves  
sysadmin@sysadmin:~$ less mangroves  
sysadmin@sysadmin:~$
```

```
sysadmin@sysadmin: ~  
38 ls -a  
39 touch lemon  
40 touch apple  
41 ls -l  
42 ls  
43 pwd  
44 touch banana  
45 ls  
46 rm banana  
47 ls  
48 mv apple apples  
49 touch mango  
50 ls  
51 cd..  
52 cd ..  
53 cp apples mango  
54 cp apples.txt mango.txt  
55 less  
56 less apples  
57 cd home/  
58 cd Home/  
59 cd Desktop/  
60 less apples  
61 mkdir trees  
62 touch banyan  
63 touch mangroves  
64 touch coconut  
65 ls  
66 rm apples  
67 rm lemon  
68 rm mango  
69 ls  
70 pwd  
71 less coconut  
72 mkdir fruits  
73 mkdir colours  
74 touch red  
75 touch blue  
76 touch green  
77 ls  
78 pwd  
79 cd  
80 rmdir colours  
sysadmin@sysadmin: ~  
48 mv apple apples  
49 touch mango  
50 ls  
51 cd..  
52 cd ..  
53 cp apples mango  
54 cp apples.txt mango.txt  
55 less  
56 less apples  
57 cd home/  
58 cd Home/  
59 cd Desktop/  
60 less apples  
61 mkdir trees  
62 touch banyan  
63 touch mangroves  
64 touch coconut  
65 ls  
66 rm apples  
67 rm lemon  
68 rm mango  
69 ls  
70 pwd  
71 less coconut  
72 mkdir fruits  
73 mkdir colours  
74 touch red  
75 touch blue  
76 touch green  
77 ls  
78 pwd  
79 cd  
80 rmdir colours  
sysadmin@sysadmin: ~  
81 ls  
82 rm red  
83 rm blue  
84 rm green  
85 ls  
86 pwd  
87 cp coconut mangroves  
88 less mangroves  
89 history  
sysadmin@sysadmin: ~$
```

**mkdir**: Create a new directory.

- **mkdir new\_directory**: Creates a directory named "new\_directory".

**touch**: Create a new file.

- **touch new\_file**: Creates a file named "new\_file".

**ls**: List files and directories in the current directory.

- **ls -l**: Long listing format (shows file details).
- **ls -a**: Show all files, including hidden ones.

**pwd**: Print working directory (shows the current directory path).

**cd**: Change directory.

- **cd /path/to/directory**: Move to the specified directory.
- **cd ..**: Move up one level in the directory hierarchy.

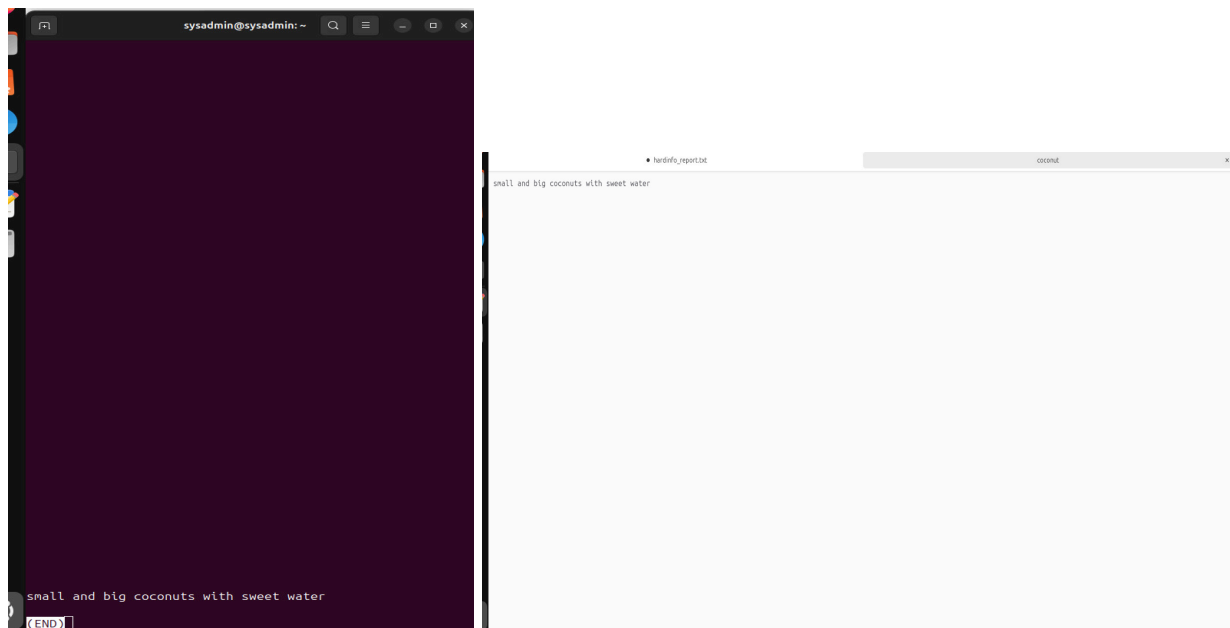
- `cd ~`: Move to the home directory.

**rm**`dir`: Remove an empty directory.

- `rm` `directory_name`: Removes the specified empty directory.

**rm**: Remove files or directories.

- `rm file_name`: Deletes the specified file.
- `rm -r directory_name`: Deletes a directory and its contents recursively.



**cp**: Copy files or directories.

- `cp source_file destination_file`: Copies a file.
- `cp -r source_directory destination_directory`: Copies a directory recursively.



**mv:** Move or rename files or directories.

- `mv old_name new_name`: Renames a file or directory.
- `mv file_name /path/to/destination`: Moves a file to a different location.

**history:** show all previously typed commands

## WHAT IS GIT GITHUB?

**GIT-** Git is a DevOps tool used for source code management. It is a free and open-source version control system used to handle small to very large projects efficiently. Git is used to tracking changes in the source code, enabling multiple developers to work together on non-linear development.

**GITHUB-** GitHub is a cloud-based platform where you can store, share, and work together with others to write code. Storing your code in a "repository" on GitHub allows you to: Showcase or share your work. Track and manage changes to your code over time. Let others review your code, and make suggestions to improve it.

**CONCLUSION:-** Hence we have learnt about Introduction to open source technology, internet, open source operating systems and open source platforms. We have also gained some knowledge about Linux commands by reading about them and implementing some of them. We now know that linux commands are text-based instructions used to perform tasks and manage various aspects of a Linux operating system. These commands are executed in a terminal or command-line interface (CLI) and enable users to interact with the system. We have also read briefly about Git and GitHub in this laboratory session.