1. What is git and github?

Git: Git is a tool that helps you track changes in your files (like code or documents) over time. It allows you to:

Keep a history of all changes made to your project.

Work on different parts of your project without messing up the main version.

Go back to previous versions if something goes wrong.

GitHub : Github is a website where you can store and share your Git projects with other people. It makes it easy for people to:

Collaborate on projects by sharing their work.

See changes made by others and suggest improvements.

Manage and track issues (bugs or tasks) in a project.

2. What is CVCS and DVCS ?

CVCS:(Centralized Version Control System)

CVCS is a system where there is one central copy of your project, and everyone who works on the project connects to that central copy to make changes.

All users need to be connected to the central server to work on the project.

If the server is down or unavailable, no one can make changes.

Example: SVN (Subversion) is a type of CVCS.

DVCS:(Distributed Version Control System)

DVCS is a system where every user has a full copy of the entire project (including its history) on their own computer.

You can work on your project offline (without being connected to the internet).

Later, you can sync your changes with the central version when you are online.

Example: Git (used with GitHub) is a type of DVCS.

3.Create a project of any and push the project

I have Created a new folder for my project:

my folder name is 'myproject'

Open the folder in VS Code:

Go to VS Code, click File > Open Folder and select the newly created folder(myproject).

Create a new file :
I have created a new file name as index.html

Inside VS Code, click on File > index.html, and I have started writing my code.

html
Copy

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>My Project</title>
</head>
<body>
  <h1>Hello, World!</h1>
</body>
</html>
```

Step 2: Initialize Git in the Project Folder
Open Terminal in Visual Studio Code:
git init
Step 3: I have Staged and Commit my Changes
Stage your files (add the files to Git):
git add .
This stages all files in project to be committed.
Commit your changes:
git commit -m "Initial commit"
Step 4: Create a GitHub Repository
Go to GitHub: Open GitHub and log in.
Create a new repository:
On the GitHub homepage, click on the New button on the left or navigate to Create a new repository.
Give repository a name . my repository name is My_project and click Create repository.
Step 5: Link Your Local Git Repository to GitHub
Copy the GitHub repository URL:
After creating the repository, GitHub will show you a URL to clone repository. Copy the HTTPS URL :
this is my https url :
https://github.com/SuneethaVemula1234/my_project.git
Add the remote repository to your project:
Go back to the terminal in VS Code and run the following command:
git remote add origin
https://github.com/SuneethaVemula1234/my_project.git
Step 6: Push Your Project to GitHub
Push the changes to GitHub:
git push -u origin master
Enter your GitHub username and password (if prompted).

Step 7: Verify on GitHub
Go to your GitHub repository page
You should see your project files uploaded successfully!

4.Create 3 branches and 5 tags
I have created 3 brances here , names with develop, test, release
first branch creation:
git checkout -b develop
second branch creation:
git checkout -b test
Third branch creation:
git checkout -b release

5 tags:
Create the first tag:
git tag v1.0
Create the second tag:
git tag v1.1
Create the third tag:
git tag v2.0
Create the fourth tag:
git tag v2.1
Create the fifth tag:
git tag v3.0

after that i have pushed all the Branches and Tags to GitHub
git push origin develop
git push origin test
git push origin release
Push all tags:
git push origin --tags

5.Create a Keygen and push using ssh

Generate SSH key:

ssh-keygen -t rsa -b 4096 -C "suneethavemula@puropalecreations.com"

Start SSH agent and add the key:

eval "$(ssh-agent -s)"

ssh-add ~/.ssh/id_rsa

Add SSH key to GitHub by copying my public key and pasting it in the GitHub settings.

Initialize Git, commit changes, and set the remote:

git init

git add .

git commit -m "Initial commit"

git remote add origin git@github.com:SuneethaVemula1234/my_project.git

Push to GitHub:

git push -u origin master

now successfully created an SSH key,and added it to GitHub, and pushed my project using SSH

6.Create a sub branch in agit and switch from subbanch to mainbranch(hit: use merge concept)

create a subbranch:

here, I have created a subbranch name as lucky:

git checkout -b lucky

The main branch is named master.

The sub-branch is named as lucky

now, u have to check which branch u are in by using this below command:

git branch

This will list all branches, and the current branch will be marked with an asterisk (*).
now, am in maser branch
once u use this command:
git checkout master
This command switches you from your sub-branch (lucky) to the main branch(master).
Merge the Sub-Branch into the Main Branch
git merge lucky

7.What is the importance of git checkout?
git checkout is important because it allows you to:
Switch between branches: You can move from one branch to another to work on different tasks. For example, if you're working on a feature in develop branch, you can switch to the main branch to work on something else.

Revert changes: If you made a mistake, git checkout can help you discard changes or restore files to an earlier version.
Example:
git checkout main # Switch to the main branch
8.What is the importance of git merge?
git merge is important because :

Combine changes: It brings together the work you've done on one branch (like a develop branch) into another branch (like the master branch). This is how you integrate your work with the main project.

Collaborate with others: If multiple people are working on different parts of the project in separate branches, git merge helps combine everyone’s work into the final version.

Example:
git merge develop branch

9.What is Linux and how is it different from other operating systems?

- Linux is a free and open-source operating system. It was developed by Linus Torvalds in 1991. Linux is considered one of the most stable, secure and reliable operating system widely used in servers and supercomputers. Linux is a type of operating system that is similar to Unix it is build upon the Linux kernel. It is a multi-user based operating system. It means multiple users can access this operating system at a time.

- High security, it is a distributed operating system and community-based operating system.

- It is a user friendly. Linux is compatible with large number of files.

- Kernel is the brain of the operating system because it is going to manages a hardware resource and provides essential services for all other parts of the operating system.

- Some distributions of Linux such as ubuntu, fedora, Debian, centos, SUSE.

Different from other operating systems:

Features	Linux	Other operating systems

Source code access	Open source, allowing users to view, modify, and distribute the code.	Proprietary, source code is not accessible to users.
Cost	It is free to use and distribute.	Costlier compare with Linux.
User interface	Highly customizable.	Less customization.
security	Security is high.	Security is less.
File system	Supports various file systems .example: ext4, btrfs.	Primarily uses NTFS, APFS.
System resource usage	Typically, more lightweight and efficient, making it suitable for older hardware.	Generally, requires more system resources.

10.What are the basic Linux commands for file operations?

- - - - - - - -Touch: Creates an empty file.

Syntax: Touch [f1.txt]

- - - - - - - - -Ls:It shows total files what we created.

Syntax: ls

- - - - - - - - - Cp: copy

Copies files or directories

Syntax: Cp [f1.txt] [f2.txt]

- - - - - - -Mv: Moving/renaming

Moves or renames files and directories.

Syntax: mv [old filename] [new filename]

syntax:mv[f5.txt][f6.txt]

-- - - - - - - - Rm: remove

Removes files.

Syntax: rm [filename]

syntax: rm[f5.txt]

- - - - - - - - Cat:Displays the content of a file.

Syntax: cat [filename]

syntax: caty[f5.txt]

- - - - - - - - Head:Displays the first few lines of a file.

Syntax: head [filename]

- - - - - - - - - Tail:Displays the last few lines of a file.

Syntax: tail [filename]

Syntax: tail[f6.txt]

- - - - - - - - Grep: global regular expression print

Searches for a specific pattern in files.

Syntax: grep “word” [filename]

- - - - - - - - -Find: Searches for files in a directory hierarchy.

11. What is the difference between chmod and chown?

feature	Ch mod	Chown
purpose	Change file permissions. Chmod allows you to set read, write, execute permissions.	Change file ownership. Chown enables you to change who the owner of the file is.
syntax	Ch mod [mode] [file]	Chown [new_owner:new_group] [file]
parameters	Permissions(numeric/symbolic)	New owner and optional group.
Affects	Access rights	Ownership.
Use case	Granting/denying permissions.	Changing the file’s owner.

12.Explain the use of grep command.

- Grep means global regular expression print.
- The grep command in Linux is powerful tool used for

searching and manipulating text patters within files.

- Grep is widely used by programmers, system administrators, and users alike for its efficiency and versatility in handling text data.

- Syntax: grep “word” filename.

- Grep –c: this prints only a count of the lines that match a pattern.

- -h: display the matched lines, but do not display the filenames.

- -i: ignores, case for matching

- -l: displays list of a filenames only.

- -n: display the matched lines and their line numbers.

- -v: displays lines that do not matches the pattern.

13. How do you schedule a cron job in Linux?

- The cron daemon is a built in Linux utility that reads the crontab file and executes commands and scripts at predefined times and intervals.

- Cron is a time-based job scheduler in Linux operating

system, allowing users to run scripts or commands at specified intervals.

- Scheduling a job for a specific time.
- To view the crontab entries.
- To edit crontab entries edit the current logged-ln users crontab entries.
- To schedule a job for every minute using cron.
- To schedule a job for more than one time.
- To schedule a job for a within certain range of time.
- To schedule a background cron job for every 10 minutes.
- To schedule a job for the first minute of every year using@yearly.
- To schedule a cron job beginning of every month using@monthly.
- To schedule a background job every day using@daily.
- To execute a command after every reboot using @reboot.

14. Explain the basic features of the Linux OS.

- Free and open source: it is free of cost and the source code of Linux is freely available to the public.
- Multiuser capacity: Linux supports multiple users accessing the system simultaneously.
- Multitasking: Linux can run multiple processes at the same time.
- Security: Linux has built in security features, including user permissions and access controls.
- Portability: it is run on various hardware platforms.
- File system: Linux supports various file systems, including ext4, btrfs, xfs and more.
- Customization: it is highly customizable, allowing users to modify the OS according to their preferences.
- Networking capabilities: Linux has robust networking features, supporting various protocols and services.
- Command-line interface: it provides powerful command line interface for system management and automation.

15. What are the major differences between Linux and Windows?

Linux	windows

Linux is a free and open source.	It is not open-source operating system
It is free of cost.	Windows is paid and requires a license.
File names are case sensitive	File names are case insensitive.
Uses a monolithic kernel.	Uses hybrid kernel.
More secured and stable	Less secured.
Single user-based operating system.	Multi user based operating system.
In Linux three types of user accounts: regular, root and service account.	In windows four types of user accounts: administrator, standard, child and guest.

16. Define the basic components of Linux.

- Linux is a powerful and versatile operating system that consists of several key components.

  - Kernel:

    kernel is the core component of the Linux operating system.it manages system resources and facilitates communication between hardware and software. It is responsible for all major activities of this operating system.

    It manages CPU, memory, and device drivers.

    Handles system calls and process management.

    Provides security and access control.

  - Shell:

    The shell is a command line interface that allows users interact with the operating system. It interprets user commands and communicates with the kernel. Command execution and scripting. File manipulation and system administration tasks.

Bash: bourne again shell the most common shell in Linux.

Zsh, ksh, fish.

- System library:

  System libraries provides standard function and routines that applications can use to perform tasks without needing to access the kernel directly.

  Example: libc-the standard C library.

  Libm-the math library.

- File system:

  The file system organizes and manages data on storage devices. Linux uses a hierarchical file system structure.

  Example:ext4,xfs,btrfs, and zfs.

  Ext4 most widely used file system for linux.

- User space:

  It is the memory area where your applications and processes run, separate from kernel space.

- System utilities:

  System utilities are programs that perform system-related tasks, such as file management, process management, and system monitoring.

  Example: ls, cp and top.

17. What is the chmod command in Linux, and how do you use it?

- Linux chmod command is used to change the access permissions of files and directories.
- It stands for change mode.
- It cannot change the permissions of symbolic links.
- In the Linux system each file is associated with a particular owner and have permission access for different users.
- User classes are:
- Owner
- Group member
- Others.
- The file permissions in Linux are the following three types:
- Read (‘r’)
- Write (‘w’)
- Execute (‘x’)

  Example: chmod u+x filename

chmod g-w filename

chmod 644 filename

chmod 755 filename

18. What are the most important Linux commands?

- Ls : it is showed list of files and directories.
- Cd: it is changed the directory
- Pwd: it prints the current working directory.
- Mkdir: it creates the new directory.
- Rmdir: it removes the empty directory.
- Rm: it removes the files.
- Rm –r : it removes the directory.
- Cp: copy files or directories.
- Mv: it is used to moves or renames files or directories.
- Cat: it displays the file content.
- More: views file content page by page.

- Less: similar to more but allows backward navigation.
- Vim: a powerful text editor with advanced features.
- Top: displays running processes and system resource usage.
- Df: displays disk space usage.
- Du: displays disk usage of files and directories.
- Free: displays memory usage.
- Uname:it displays operating system name.
- Ping: tests network connectivity to a host.
- Ifcongif: displays network interface configuration.
- Whoami: displays the current logged-in-user.
- Adduser: add a new user.
- Passwd:changes a user's password.
- Man: displays the system interface.
- History: it shows the commands history.

- Clear: it clears the console or terminal.
- Grep: it searches the particular word.
- Cal: it displays the present month calendar.
- Date: it displays the todays date.
- Head: it gives top 10 lines in the file.
- Tail: it gives bottom 10 lines in the file.
- Wc: it s used to count the lines, words, and characters in the file.

19.How do you create,remove and copy files in linux?

Create a file:

To create a new file, you can use the touch command:
touch filename.txt
touch index.txt
This creates an empty file called index.txt.

Remove a file:

To remove (delete) a file, use the rm command:
rm filename.txt
rm index.txt
This deletes index.txt from your system.
Be careful, as this command doesn't ask for confirmation by default.

Copy a file:

To copy a file from one location to another, use the cp command:
cp index.txt /path/to/destination/
This copies index.txt to the specified destination.
cp f1.txt f6.txt

20.What is ssh?

SSH (Secure Shell) is a protocol that allows you to securely connect to a remote computer or server over a network. It's commonly used to manage servers, access remote systems, and transfer files in a safe way.
Login to remote servers securely.
Execute commands on remote systems as if you were sitting right in front of them.
Transfer files securely between computers.