Git and Github

What is Git

Git is a version control system.
Version control system is used to track our code changes by which we can know what changes we have done and track down bugs or go back to the previous version if there is a problem in the current version.

Git is a free and open source software and most used version control system.
It was created by Linux Torvalds who also created linux os.

Why is git used by most of the people

Because

- It is a distributed version control system - we do not rely on one server to store the different versions of the code or project.
- Coordinates work between multiple developers
- While working in team we can know who made what changes and when

Install Git on your system

Install git in windows and mac
Go to https://git-scm.com/download/

Install git in Linux using command
Deb - sudo apt-get install git
Arch - sudo pacman -S git
Fedora- sudo yum install git

After installing git in your system you have to configure git
For that we have to go to command prompt in windows or terminal in mac or linux and write command

```
git config --local user.name username
git config --local user.email Email.Address
```

In Git there are 4 stages

1. Working Directory
2. Staging area
3. Head or Local Repo
4. Remote Repo

Terms

Directory - Folder
Repository or repo - Project or folder which whole code
Terminal - Command line or command prompt

Some basic Terminal commands

In Windows	**In other OS**	**Application of command**
dir	ls	It list all the folders or directory
cd	cd	It changes folder or directory
chdir	pwd	Returns your current directory location
mkdir	mkdir	Make new empty directory
rmdir	rmdir	Delete directory
touch filename	touch filename	It creates an empty file
del filename	rm filename	It deletes a file
type	cat	To print the contents of a file.
copy filename	cp filename	Copying a file
cls	clear or <ctrl- l>	It clears the terminal
exit	exit	Close terminal

Git Commands

git init :- This command creates a new git Repository.
Note: Whatever file you create in the Folder it will be in the working directory stage

git add filename :- This command is used to add the file into the staging area.
Note: if we change some code after adding file to staging are then the changes will not be updated so to update you have to add the file to staging area again.

git add . - this command adds all changes and newly created files to the staging area.

git status :- this command shows the stages of files. If files are in the working directory then it will be in red , if files are in the staging area then it will be shown in green color.

git rm --cached <file> :- this command removes the file from staging area

git commit -m "comment" :- this command moves the code into the local repo stage. If we commit at any stage then it will be like a checkpoint, so after this if we code and make a mistake we can always come back to the same position of code when we had created a checkpoint.
"-m" stands for message so here we can write some comments about commit.

git log :- this command gives the history of all commits and it also show code which is unique for every commit and used when we want to go back to that commit
Git reset HEAD~1 :- this command uncommit the last commit
Git reset --hard <code> :- this command completely go back to the required commit

git push -u origin main :- this push the changes to the github or to remote repo. From here this will be seen by everyone if the repo is made public.
Note: while pushing it will ask for username and password of github give it then go to github and we can see the files pushed from our computer to the github

git branch :- this command list the branches and shows at what branch we are in at present state
git checkout -b <branch-name>:- It creates new branch
git checkout <branch-name> :- it changes from one branch to required branch
git push -u <branch-name> :- it pushes only branch to the github. After this command we can go to the github and compare and if there is no conflict we can merge the branch to the main branch.
git merge <branch-name> :- we can merge branches using commands also . we have to be in the branch to which the other branch is merging and then use this command to merge branches.

Note: When we work in a team all team members will contribute and we have to be updated with our local directory or in other words we have to download the changes made by others and according to that we have to continue with our work .

git pull :- this command will update with the changes made in github to our local directory .
git clone <link> :- this command is used to download project to our pc

Git Ignore files
If we want some files to not to be uploaded to the github then we can ignore those files

We create a directory named .gitignore
Add all the files which should be ignored in this folder.