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Git and GitHub

Git is a VCS that supports distributed nonlinear workflows by providing data assurance for developing quality software.

Its features are as follows:

- **Distributed**: A distributed development of code
- **Compatible**: Works with existing systems and protocols
- **Non-linear**: Allows the non-linear development of code
- **Branching**: Easy to create and merge branches
- **Lightweight**: Lossless compression
- **Speed**: Faster than the remote repository
- **Open-source**: A free tool and hence economical
- **Reliable**: Not viable to any loss of data upon crashes
- **Secure**: Uses SHA1 and checksum

Git Operations and Commands

Git Configuration

- For the initial configuration of username, email, and code highlighting (optional):

```
$git config -- global user.name"firstname lastname"
$git config -- global user.email" abc123@abc.com"
$git config -- global color.ui true (enables code highlights)
$git config --list
```

Initializing Git

- To initialize:

```
$git init
```

- To know the status:

```
$git status
```

Adding and Removing Files

- To add a file:

```
$git add<filename>
```

- To add multiple files:

```
$git add<filename> <2nd filename> <3rd filename>
```

- To add all the updated files:

```
$git add --all ( use -A instead of -all too )
```

- To remove files:

```
$git rm -r <filename>
```

Committing Changes

- To pass a message, use 'commit' with '-m':

```
$git commit -m "body_of_message"
```

- To amend the last commit or the last message:

```
$git commit --amend -m "new_message"
```

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Pushing and Pulling

Here, a remote repository typically represents a remote server or a Git server.

- To create a remote repository via GitHub, go to:

```
https://github.com/YourUsername/appname.git
```

- To add a link:

```
$git remote add origin<link>
```

- To push files:

```
$git push -u origin master
```

- To clone files:

```
$git clone <clone>
```

Branching and Merging

Command	Description
git branch	To list branches
git branch -a	To list all the branches
git branch [branch name]	To create a new branch
git branch -d [branch name]	To delete a branch
git push origin –delete [branchName]	To delete a remote branch
git checkout -b [branch name]	To create a new branch and switch to it
git checkout -b [branch name] origin/[branch name]	To clone a remote branch and switch to it
git checkout [branch name]	To switch to a branch

git checkout –	To switch to the branch last checked out
git checkout — [file-name.txt]	To discard the changes made to a file
git merge [branch name]	To merge a branch into an active branch
git stash	To stash the changes in a dirty working directory
git stash clear	To remove all the stashed entries

Sharing and Updating Projects

Command	Description
git push origin [branch name]	To push a branch to a remote repository
git push -u origin [branch name]	To push the changes made to a remote repository (-u remembers the branch for the next use)
git push origin –delete [branch name]	To delete a remote branch
git pull	To update a local repository to the newest commit
git pull origin [branch name]	To pull the changes from a remote repository
git remote add origin ssh://git@github.com/[username]/[repository-name].git	To add a remote repository
git remote set-url origin ssh://git@github.com/[username]/[repository-name].git	To set a repository's origin branch to SSH

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Inspection and Comparison

Command	Description
git log	To view the changes made
View changes	To view changes (in detail)
git diff [source branch] [target branch}	To preview changes before merging

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