1.CONCEPT OF GIT:

Version Control System (VCS) is a software that helps software developers to work together and maintain a complete history of their work.

The functions of VCS are:

* Allows developers to work simultaneously.
* Does not allow overwriting each other’s changes.
* Maintains a history of every version.

Some of the terms used in git are:

BRANCH- version of the repository that diverges from the main working project. Branches can be a new version of a repository, experimental changes, or personal forks of a repository for users to alter and test changes.

CLONE-A clone is a copy of a repository or the action of copying a repository. When cloning a repository into another branch, the new branch becomes a remote-tracking branch that can talk upstream to its origin branch (via pushes, pulls, and fetches).

FORK-create a copy of the repository.

PULL/PUSH REQUEST-If someone has changed code on a separate branch of a project and wants it to be reviewed to add to the master branch, that someone can put in a pull request. Pull requests ask the repo maintainers to review the commits made, and then, if acceptable, merge the changes upstream. A pull happens when adding the changes to the master branch.

2.BASIC COMMANDS OF GIT:

* Git config command: This command configures the user. The Git config command is the first and necessary command used on the Git command line. This command sets the author name and email address to be used with your commits. Git config is also used in other scenarios.
* Git init command:This command is used to create a local repository.
* Git clone command: This command is used to make a copy of a repository from an existing URL. If I want a local copy of my repository from GitHub, this command allows creating a local copy of that repository on your local directory from the repository URL.
* Git add command: This command is used to add one or more files to staging (Index) area.

3.CONCEPT of GITHUB,GITLAB,BITBUCKET

* Github- is the most popular, with an active community of 100 million developers. It hosts 372 million repositories and is a favorite for open-source projects, with 28 million public repositories. It also provides robust CI/CD pipelines.
* Gitlab- is similar, providing hosting for code repositories. With that said, it offers a more comprehensive suite of DevOps tools (security testing, monitoring, and more) than its alternatives.
* BitBucket- is more specialized. It’s the native Git tool in Atlassian’s Open DevOps solution. It’s designed as a code repository, but only for jira and Confluence integrations and software projects

4) Industrial practices of using Git:

**Version Control:**

* **Branching and Merging:** Industries often use feature branching workflows, where each feature or task is developed on a separate branch. After completion, branches are merged back into the main branch.
* **Tagging Releases:** Git tags are used to mark specific points in history as important, such as release versions.

**Collaboration:**

* + **Forking and Pull Requests:** In larger teams, developers often fork a repository, make changes, and then create pull requests to propose those changes to the original repository. This allows for code review and collaboration.
  + **Code Review:** Git makes it easy to conduct code reviews, either through pull requests or by reviewing commits directly.

**Continuous Integration/Continuous Deployment (CI/CD):**

* + **Automated Testing:** Git is integrated into CI/CD pipelines to trigger automated testing upon each push or merge. This ensures that changes don't break existing functionality.
  + **Deployment Pipelines:** CI/CD tools like Jenkins, GitLab CI, or GitHub Actions use Git to trigger deployment pipelines when changes are pushed to specific branches.

5) Cloning a repo to local:-

**Step 1:Open a Terminal or Command Prompt.**

**Step 2: Navigate to the Desired Directory.**

**Step 3: Clone the Repository using ’’git clone’’command.**

**Step 4: Verify the Clone.**

6)Resources used: Javapoint,GitHub Docs,etc