Q.1>> what is git?

Git is a distributed version control system that tracks changes in any set of computer files, usually used for coordinating work among programmers collaboratively developing source code during software development. Its goals include speed, data integrity, and support for distributed, non-linear workflows

Q.2>> what do you understand by the term ' version control system'?

Version control, also known as source control, is the practice of tracking and managing changes to software code. Version control systems are software tools that help software teams manage changes to source code over time.

Q3>>what is github?

GitHub is a Git repository hosting service. GitHub also facilitates with many of its features, such as access control and collaboration. It provides a Web-based graphical interface.

GitHub is an American company. It hosts source code of your project in the form of different programming languages and keeps track of the various changes made by programmers.

It offers both distributed version control and source code management (SCM) functionality of Git. It also facilitates with some collaboration features such as bug tracking, feature requests, task management for every project.

Q4>> mention some popular git hosting services.

GitHub

In terms of popularity, GitHub is the most famous web-based number one hosting service. It has 70 million registered users. It is an open-source project having multiple useful features. GitHub has a user-friendly interface that is easy to understand and use.

GitLab

GitLab is the most popular and widely used hosting service that is an open-source end-to-end and collaborative software development forum with built-in version control services, code review, issue tracking, CI/CD, and many more. GitLab has 30 million registered and “1 million” active and licensed users. But the fact is, GitLab is the second most considerable Git hosting service after GitHub.

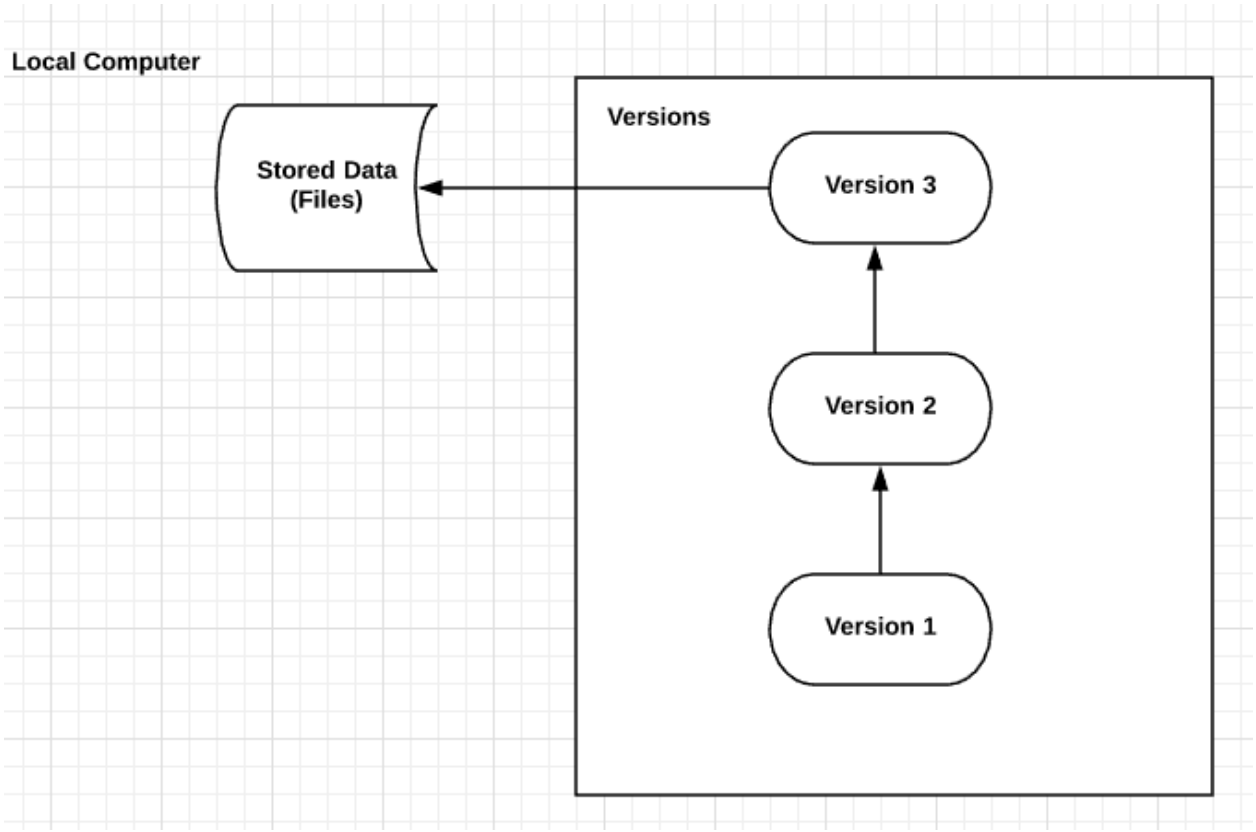
Bitbucket

Another large Git hosting service is called Bitbucket, which is similar to GitHub and has comparable functionalities. But it has a small difference. Bitbucket is a popular version control system founded in 2008 and acquired by Atlassian. It is based on more software development teams than programmers separately, as its feature allows free private repositories for users.

Q.5>>Different types of version control system?

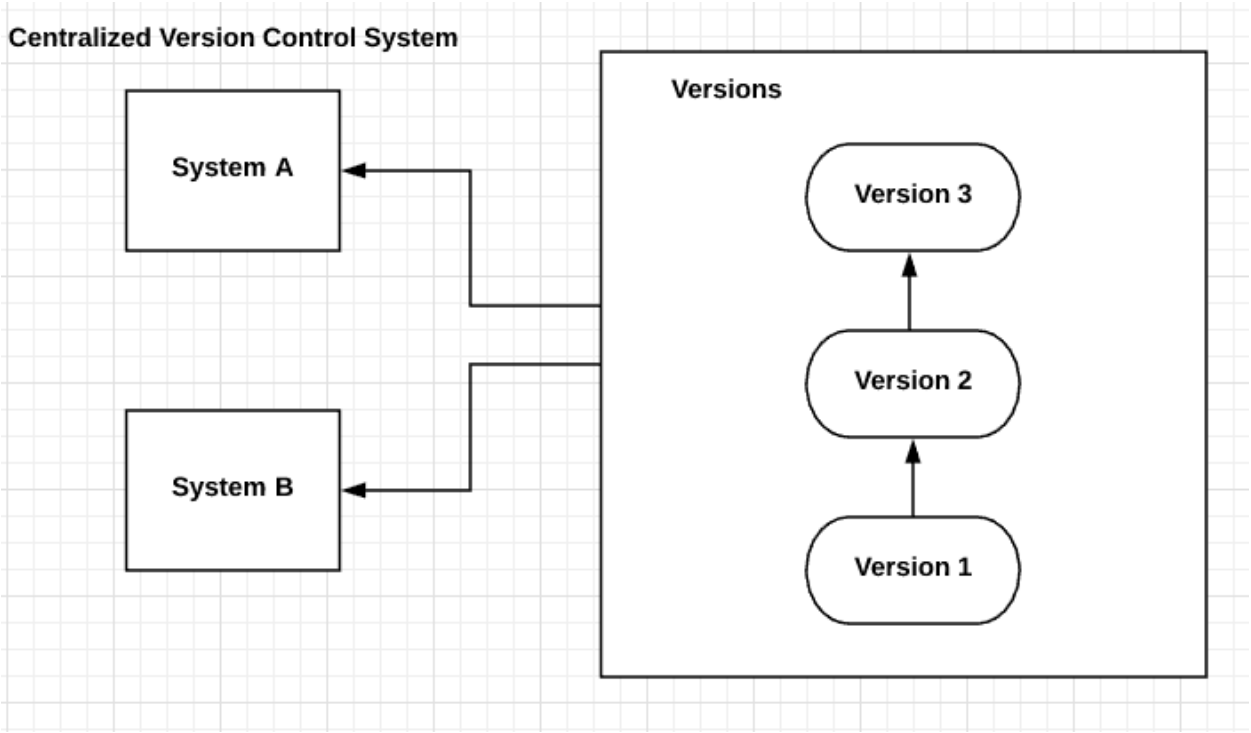
The various types of the version control systems are:
1. Local Version Control System
2. Centralized Version Control System
3. Distributed Version Control System

1. Local Version Control System:



Local version control system maintains track of files within the local system. This approach is very common and simple. This type is also error prone which means the chances of accidentally writing to the wrong file is higher.

2. Centralized Version Control Systems



In this approach, all the changes in the files are tracked under the centralized server. The centralized server includes all the information of versioned files, and list of clients that check out files from that central place.
Example: Tortoise SVN

3. Distributed Version Control System:

Distributed version control systems come into picture to overcome the drawback of centralized version control system. The clients completely clone the repository including its full history. If any server dies, any of the client repositories can be copied on to the server which help restore the server.

Every clone is considered as a full backup of all the data.
Example: Git

Q.6>>what benefits come with using git?

1. Performance

Git performs very strongly and reliably when compared to other version control systems. New code changes can be easily committed, version branches can be effortlessly compared and merged, and code can also be optimized to perform better. Algorithms used in developing Git take the full advantage of the deep knowledge stored within, with regards to the attributes used to create real source code file trees, how files are modified over time and what kind of file access patterns are used to recall code files as and when needed by developers. Git primarily focuses upon the file content itself rather than file names while determining the storage and file version history. Object formats of Git repository files use several combinations of delta encoding and compression techniques to store metadata objects and directory contents.

2. Security

Git is designed specially to maintain the integrity of source code. File contents as well as the relationship between file and directories, tags, commits, versions etc. are secured cryptographically using an algorithm called SHA1 which protects the code and change history against accidental as well as malicious damage. You can be sure to have an authentic content history for your source code with Git.

3. Flexibility

A key design objective of Git is the kind of flexibility it offers to support several kinds of nonlinear development workflows and its efficiency in handling both small scale and large scale projects as well as protocols. It is uniquely designed to support tagging and branching

operations and store each and every activity carried out by the user as an integral part of

“change” history. Not all VCSs support this feature.

Q.7>>what is a git repository?

- Repositories in GIT contain a collection of files of various different versions of a Project. These files are imported from the repository into the local server of the user for further updations and modifications in the content of the file. A VCS or the Version Control System is used to create these versions and store them in a specific place termed a repository. The process of copying the content from an existing Git Repository with the help of various Git Tools is termed **cloning**. Once the cloning process is done, the user gets the complete repository on his local machine. Git by default assumes the work to be done on the repository is as a user, once the cloning is done. Users can also create a new repository or delete an existing repository. To delete a repository, the simpler way is to just delete the folder containing the repository. Repositories can be divided into two types based on the usage on a server.

Q.8>>how can you initialize a repository in git?

Initializing a new repository: git init

To create a new repo, you'll use the git init command. git init is a one-time command you use during the initial setup of a new repo. Executing this command will create a new .git subdirectory in your current working directory. This will also create a new main branch.