**Git Remote**

A remote is a repository in another location from where we are now working and has been connected to our local laptop. For example, we might be working on the project on our local laptop and the version of the project is on GitHub. In respect to our local laptop, GitHub is a remote repository. A remote can be in any location with Git repo under a different platform. Some of the git repo platforms are Git Server with a bar repository, copy of repo within GitHub, group project with many branches  etc. We work interactively back and forth between our laptop and remote repository. When there is a change on the remote repository, we can download changes to get them locally. If we make changes to our local repository, we can upload those changes to the remote repository. The following is an example of interrelationship in Git repositories.

Diagram

Description automatically generated

**Create a repository in GitHub.**

To create a GitHub repository, you need to create an account on GitHub. After that you can click start the project, and that will lead you to create a new repository window. On that window you can fill in the repository name, and description of the project. You need to make a repo public by checking the public button so that anyone can see it.  Initialize the repository with a README and GitHub will create a file README.md. A README file can be used for the details of the repository for those who will read it. Then click create repository and it is created. GitHub made one commit automatically to add the REAME.md file to the repository.

**Clone a GitHub Repository**

To perform a clone, we need a proper URL. That can be found on the clone or download button. Click the drop-down button and you can see the clone with SSH and with Https options. When using the SSH option you need to put the SSH public key in GitHub. Copy the URL address to your laptop text editor or git Bash with git command. Git clone command downloaded an existing repository from a server to your local machine. For example,

phili@DESKTOP-GQPPAA8 MINGW64 ~

$ git clone git@github.com:WillPeers/ENSE375-groupE.git

We cloned the above repository (ENSE375-groupE.git) from git@github.com on account of WillPeers. After the project has been cloned, we can change into our local directory,  and start with the git config option command:

Git config –local user.name “phil”

Git config –local user .email paa180@uregina.ca

This command helps you to set up the username and email address which can be used with your commit file. When typing a graph on the command prompt it will show you the local master branch pointing to the single commit. In addition, there is a Head pointer point to master, and there is origin slash master and origin slash head. Origin slash master is a special branch that functions as a remote tracking branch. The local origin master branch tells us that our master branch and origin branch in GitHub are pointing to the same commit. The remote tracking branch on the other hand cannot be checked with git checkout origin/master. It will end up in a ‘detached HEAD’ state because it is not the same as the standard local branch. However, in normal conditions we do want to stay on standard local branches.

**Git fetch and Git merge**

Git fetch command is an important feature in GitHub. Its function is to extract information, or the latest update commits to the origin branch with its related objects. Developers used git fetch to see how the history has progressed. Git merge command is used to merge the file of a specific branch into the master branch. We can go back to our GitHub account and create a new file.  Write in a file and commit it. The new file will be a second commit file in the repository. Then go back to the local machine and type in git status to see that the standard branch does not recognize it yet. When typing git fetch origin, the system reaches out to GitHub and finds the new commit and brings it back. After the repository has been updated, type in merge origin/master to merge commit reference by origin/master to local branch.

Diagram

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**Git Push**

Git push origin master command is used to push the contents of the local repository to the remote repository. This git push is relying on GitHub authentication which was setup on an SSH key. This happens when the file is committed and ready to be merged into the master branch. After the push command is done, the following changes will happen: commit will be updated, the latest message will show, and the latest commit hash will appear.

**Create a GitHub Fork**

A fork repository is a copy of a repository into another new master repo. On the same account for example, Willpeers account, you can click create fork and the window will open on your account. The name of the repository will be the same as ENSE375-groupE, but the account is different. The following flow diagram shows how fork repo is created.

Diagram

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