Rachel Hussmann

Imagine working on a coding project with a team of people. Everyone has different code that they want to combine to make a full working project. However, trying to do that without additional software will easily make the merging the hardest part of the project. Thankfully, rather than needing to merge code manually, we have something that is able to do that for us. Git is software that was created to manage version control of files while also helping a team of programmers centralize their code in one place (Atlassian.com). Git comes with multiple actions that make it work the way it does.

The first action that people have to do is create a repository. A repository (also known as a repo) is a centralized holding place for the project files and the history of said files (Atlassian.com). This is typically stored locally on the machine or held on a website such as GitHub. The next action that is used is known as a Git commit. When Git recognizes that changes have been made to a file or that the file has not been uploaded to the repository at all, a programmer can perform a commit on the code (Atlassian.com). This means taking anything new or changed and adding it to the repository on the programmer's machine (Atlassian.com). Commit ties into the next action known as a push. A push is when the programmer wants to add all of the committed files and changes from their repository to a remote repository, such as GitHub (Atlassian.com). For someone to do this, they need to create the remote repository first and then tell Git that a remote repository is available for this project (Atlassian.com). Of course, if there is a way to push new files to a remote repository, there must be a way to get updated files from the remote repository. This is known as a pull. More specifically, a git pull grabs the changes from the remote repository and combines them with the repository on the programmer's device, all in one command (Atlassian.com).

If a programmer wants to try to build a brand-new function but they do not want to affect the main project, they can do what is called a fork. A fork is a complete copy of a project that is separate from the original to allow for changes to be made without possibly ruining a working project (Atlassian.com). When the fork has been tested thoroughly and the team thinks that the code can to be added to the original project, they can perform a merge. A merge is an action where two branches of a project can be combined into one branch and any changes or new files are placed together in that new branch (Atlassian.com). However, sometimes while this process is happening, a problem can arise. This is known as a merge conflict. Merge conflicts typically happen when multiple programmers are changing something about a file at the same time (Atlassian.com). The software gets confused about how to manage said changes, so it sends out an error and does not complete the merge (Atlassian.com). This warning gives the team a chance to fix the issue before trying to get Git to merge those files again.

Another aspect of Git is how a team of programmers uses Git. Not all teams will follow a singular way of using it. Whatever the case may be the team needs a set of rules that tell them how they should all use Git. When teams have different methods of using Git, it is called a Git

workflow (Atlassian.com). Git Workflows can depend on many things including the work style of the team, the scale of the project and the way that the team would like to manage code changes (Atlassian.com). There are four main types of Git workflows that are used: centralized, feature branching, Gitflow and forking (Atlassian.com). All of these workflows allow the team of programmers to work efficiently and effectively with each other and the software.

Understanding what Git is and how to use it is essential to being a good programmer. All major tech companies use this process to streamline version control. Learning it now means gaining a crucial skill that can be added to our resumes and raise our chances of getting a good first job.