Software Engineering Lab #7
Using GitHub

Git is a popular open source version control system. It uses a central server to store files and enable team collaboration. Git can track version information for directories and files. It groups all your changes to files and directories into a *revision*. User can commit changes made to files and directories or revert to a copy of past revision. Tracking changes made by users and comparing different revision of the same file is also possible. In software development, Gitis a distributed revision control and source code management (SCM) system with an emphasis on speed.

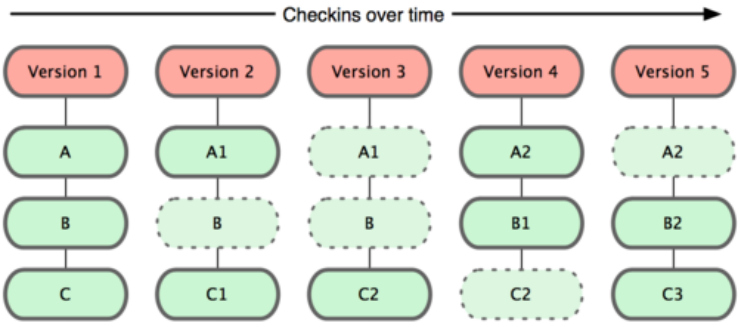

Figure 1 Git stores data as snapshots of the project over time.

Git stores the subversions of any files by keeping all of versions that have been edited at files. In Fig1, there are three files: A, B and C. If we edited A and C at version 2, then Git will create A1 as second version of A and C1 as second version of C respectively.

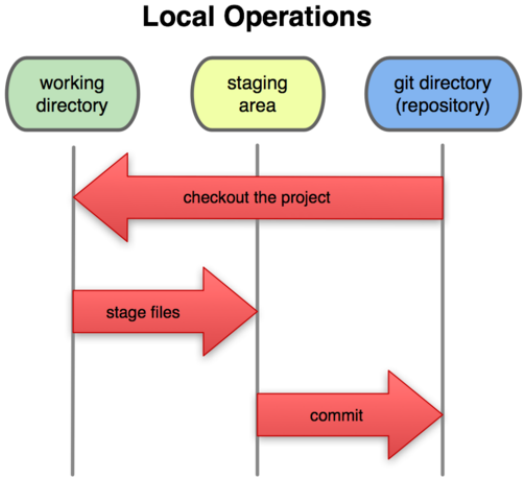

Figure 2 Working directory, staging area, and Git directory.

The basic Git workflow in Figure 2means the sequence of these activities:

- You modify files in your working directory.
- You stage the files, adding snapshots of them to your staging area.
- You do a commit, which takes the files as they are in the staging area and stores that snapshot permanently to your Git directory.

What is GitHub?

GitHub is a web-based hosting service for software development projects that use the Git revision control system.

How to register on GitHub

1. Go to https://github.com/, click "Sign up for free" to sign up for your free account by following the steps of registration on the website.

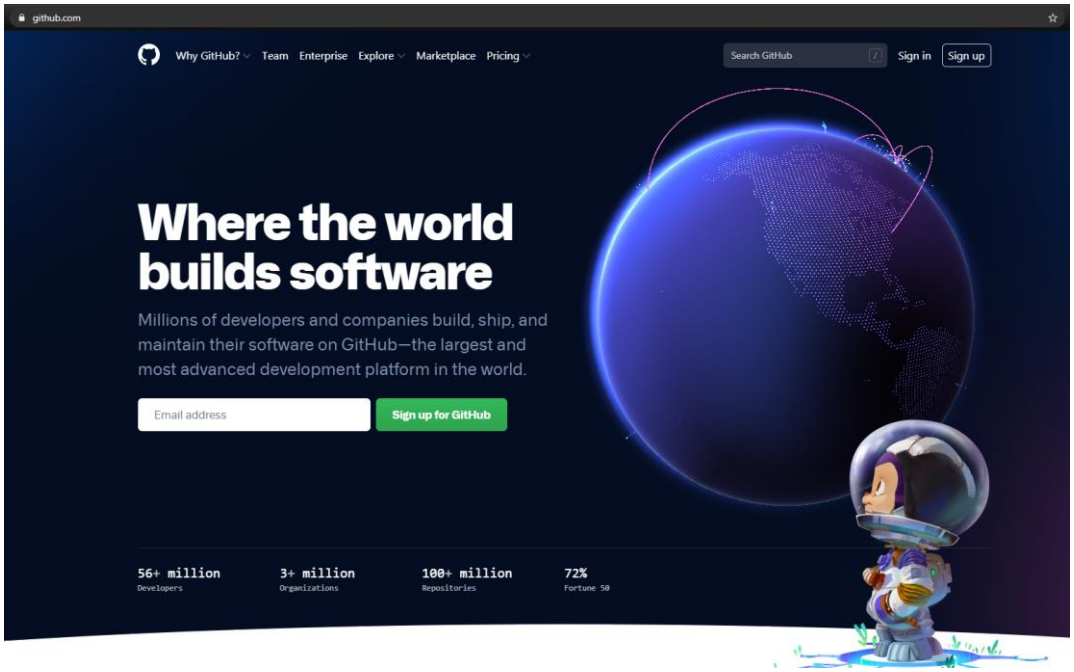

Figure 3 a github's first page

2. Download Github installer at https://desktop.github.com/ and install it on your PC.

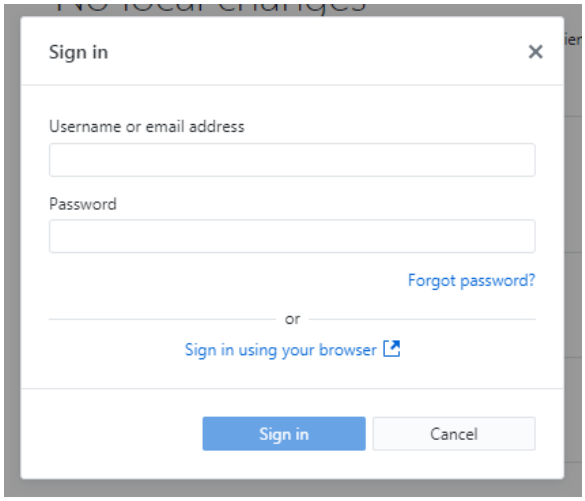

Figure 4 github's software at a login window

3. After the installation has been finished, a login window will appear on your computer (see Figure4).

Login and use GitHub

- Creating a new repository

You can create a new repository using your personal account or an organization account where you have permissions.

1. Click "add" button for creating a new repository.

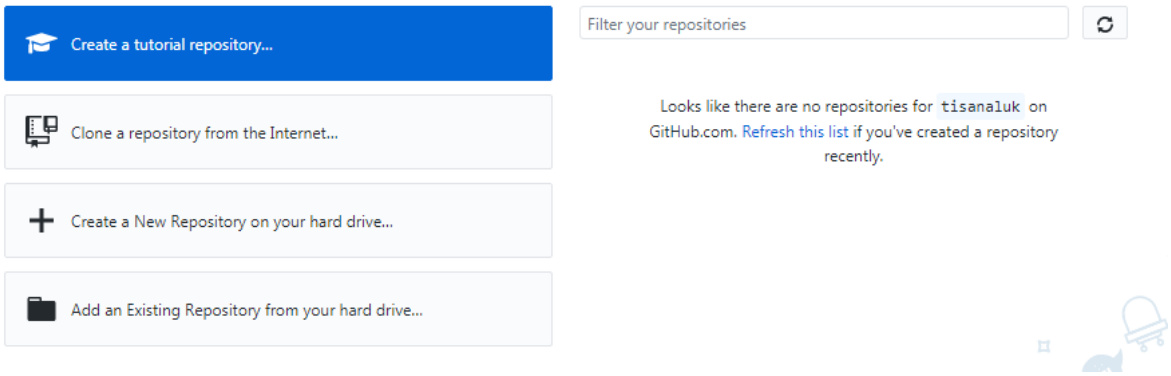

Figure 5 Github's screen for adding a new repository

2. Fill in a new repository name and select the storage directory, then click "Create repository".

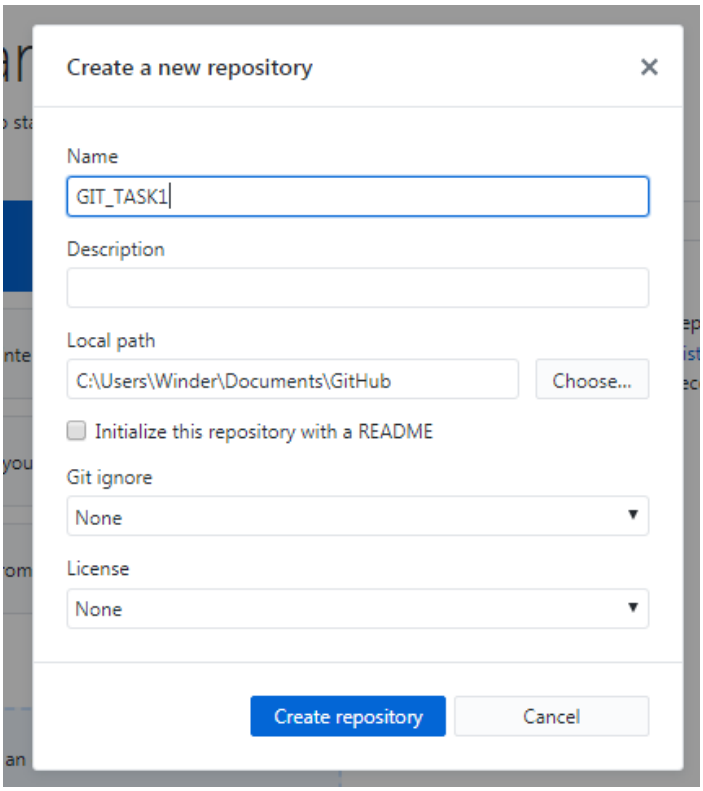

Figure 6 Github's screen when a user creates a new repository

3. Afterward, the repository will appear on the window. (Figure7 repository has a name "GIT_TASK1")

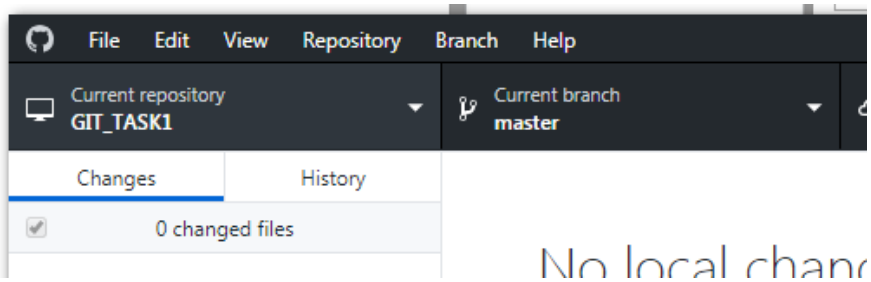

Figure 7 Github's screen with the newly created "GIT_TASK1" repository.

- Commitment

In the repository directory, you can store your files and keep updating their versions from Github software. According to figure 8, Test1.txt has been edited by adding "data1 test" string on the file, while Github keeps updating file's status and waiting for a commitment. After clicking the commitment button, the file status will be *committed*. If we want to synchronize to the Github server, you can click "publish" button. The Github will report the details of subversion on the history file window (see Figure 9). There are revert and rollback functions of any files available on this page.

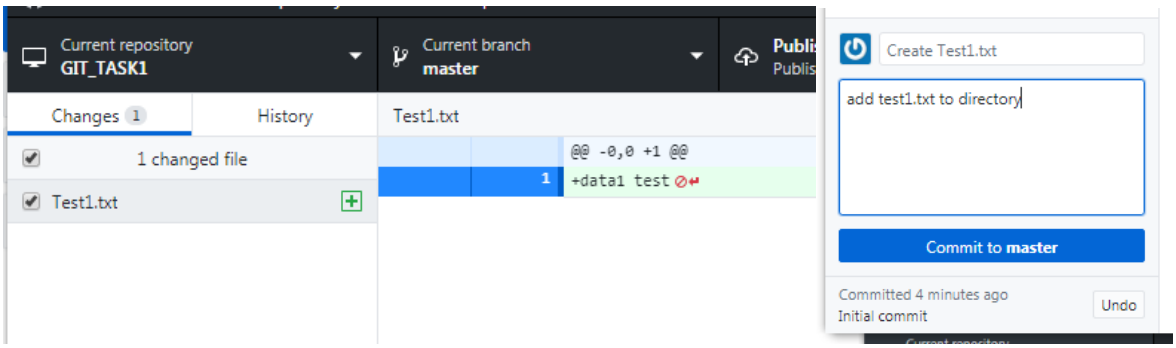

Figure 8 commitment window

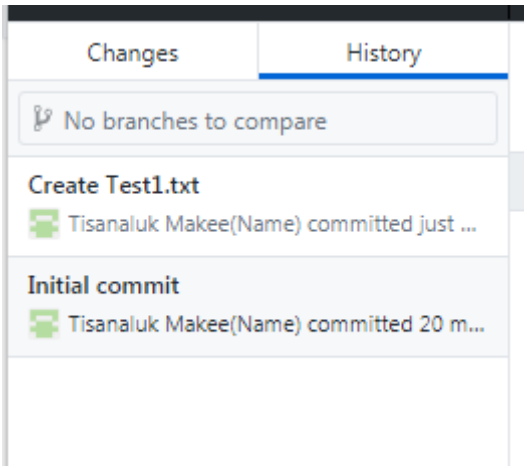

Figure 9 History of file window

You can use Github on the website (see Figure10) which provides many functions. After choosing a repository, you can copy your repository by clicking "Clone in window" (see

Figure11). You can see the details of subversions on any files at this page. The edit box name “Read+Write access” contains URL is used for sharing your project to your friends.

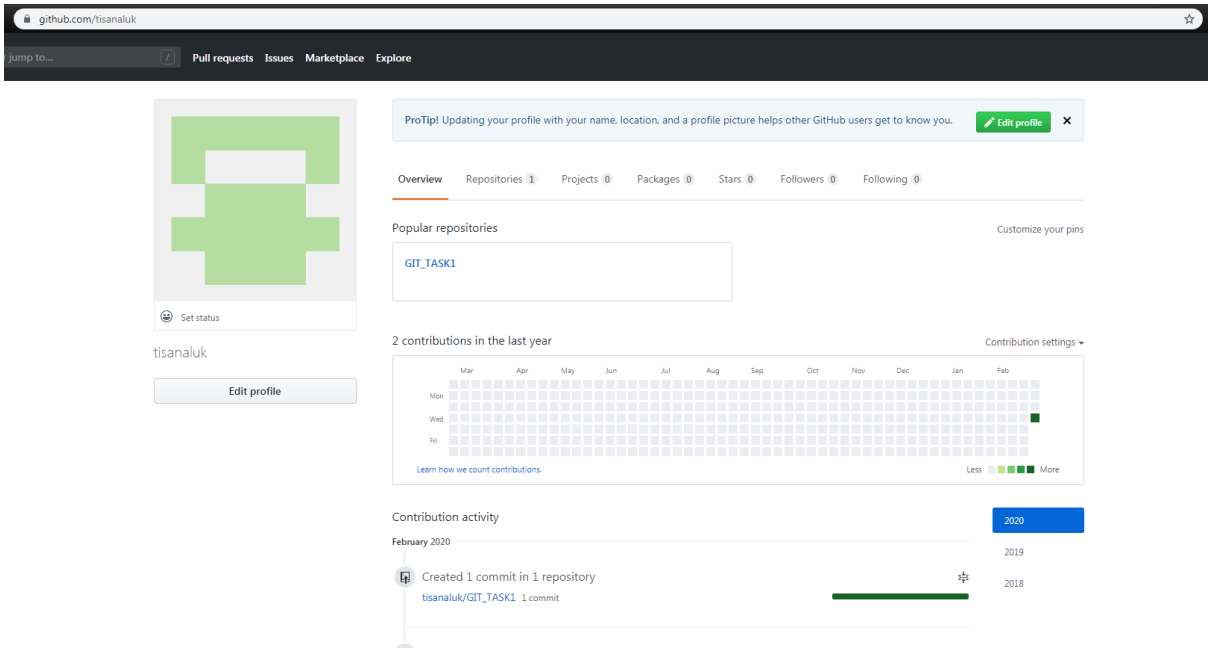

Figure 10 Github on the website

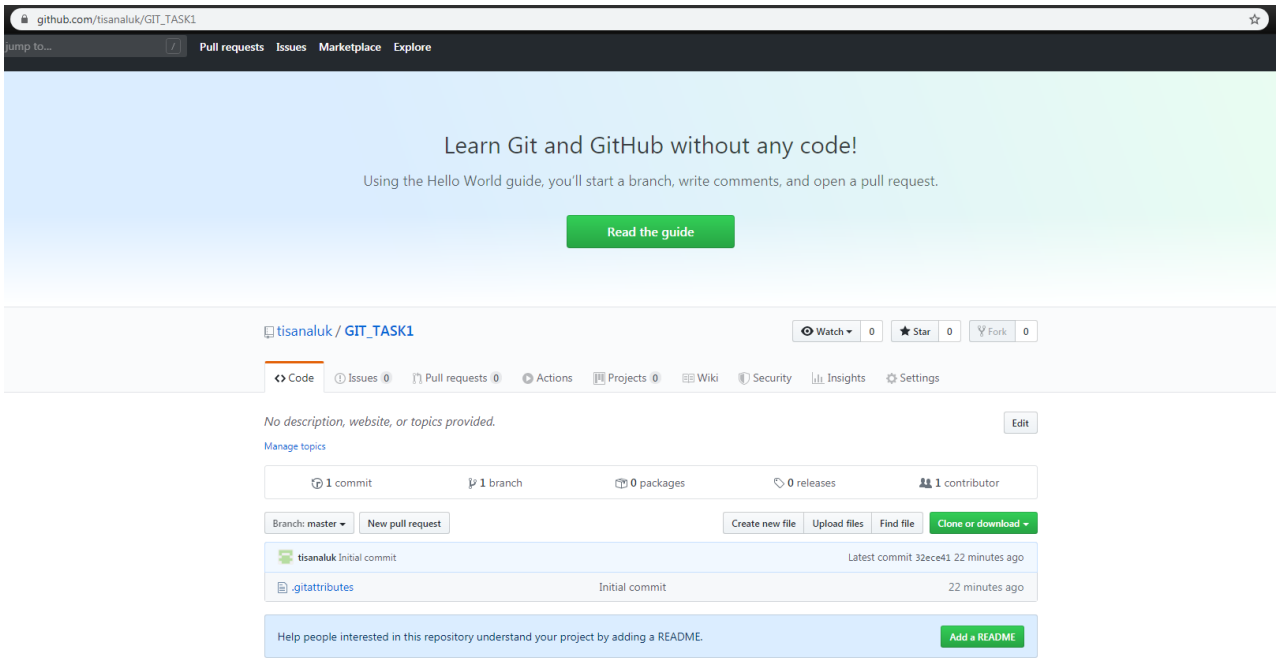

Figure 11 repository page on the website.

- Forking

At some point you may like to contribute to someone else's project, or to use someone's project as the starting point for your own. This is known as "forking." In this case, we will participate the “https://github.com/tisanaluk/GIT_TASK1” project.

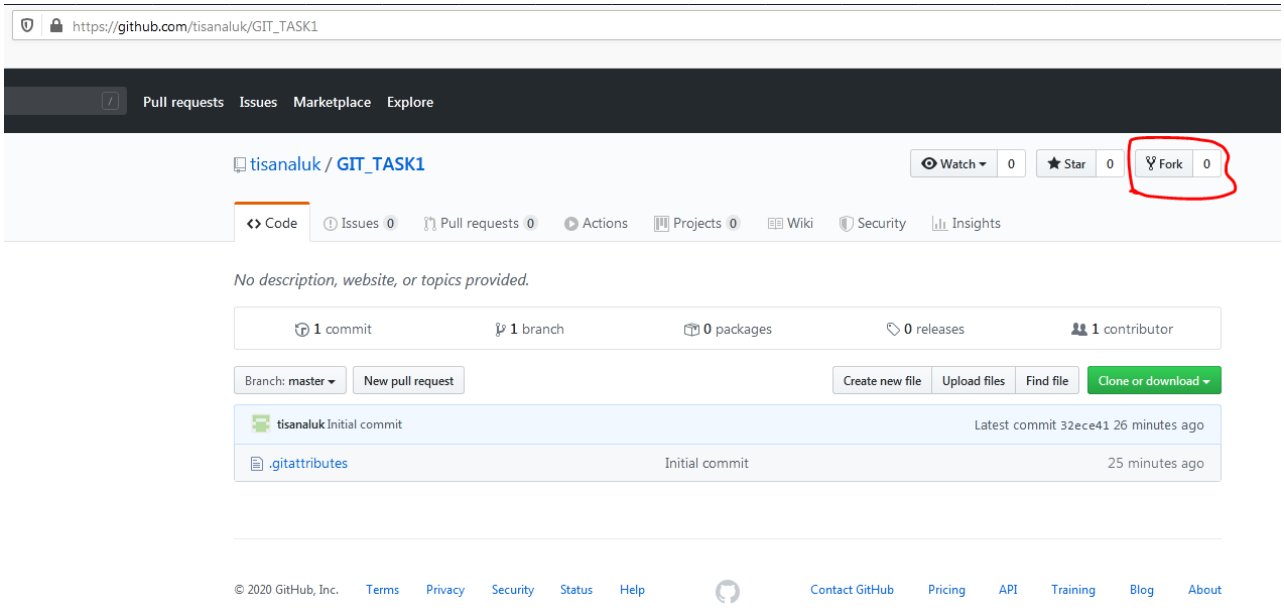

Figure 12 Forking window

Afterwards, if you have some activities in the project and would like your colleagues, who have already had forking in the it, update the current version of it, you have to pull request to your colleagues by clicking "Pull Request" button on github website (Figure 13).

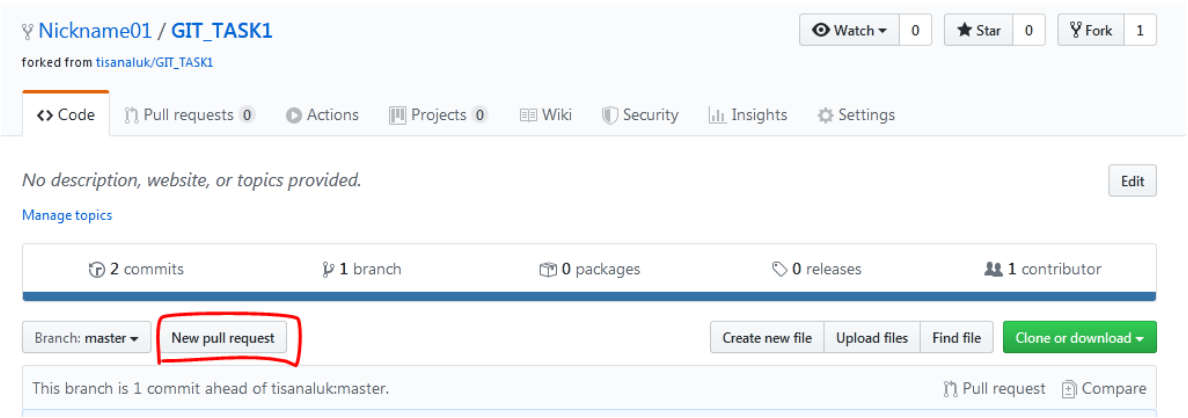

Figure 13 pull request button

When pull request window appears, you have to choose your colleague's name to send the request. In figure 14, "Nickname01" user want to send the request to "tisanaluk", of which the request consist one commit and one files changed. Then, you can click "Send pull request" button to send the request (Figure 15).

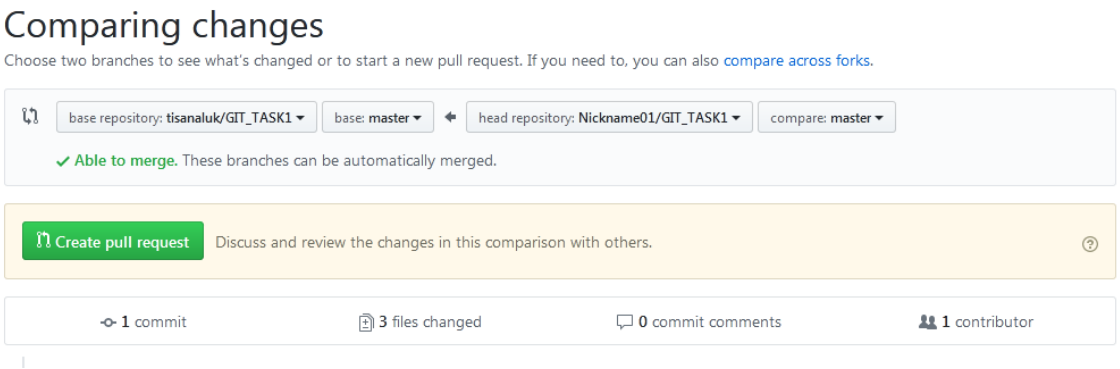

Figure 14 pull request window

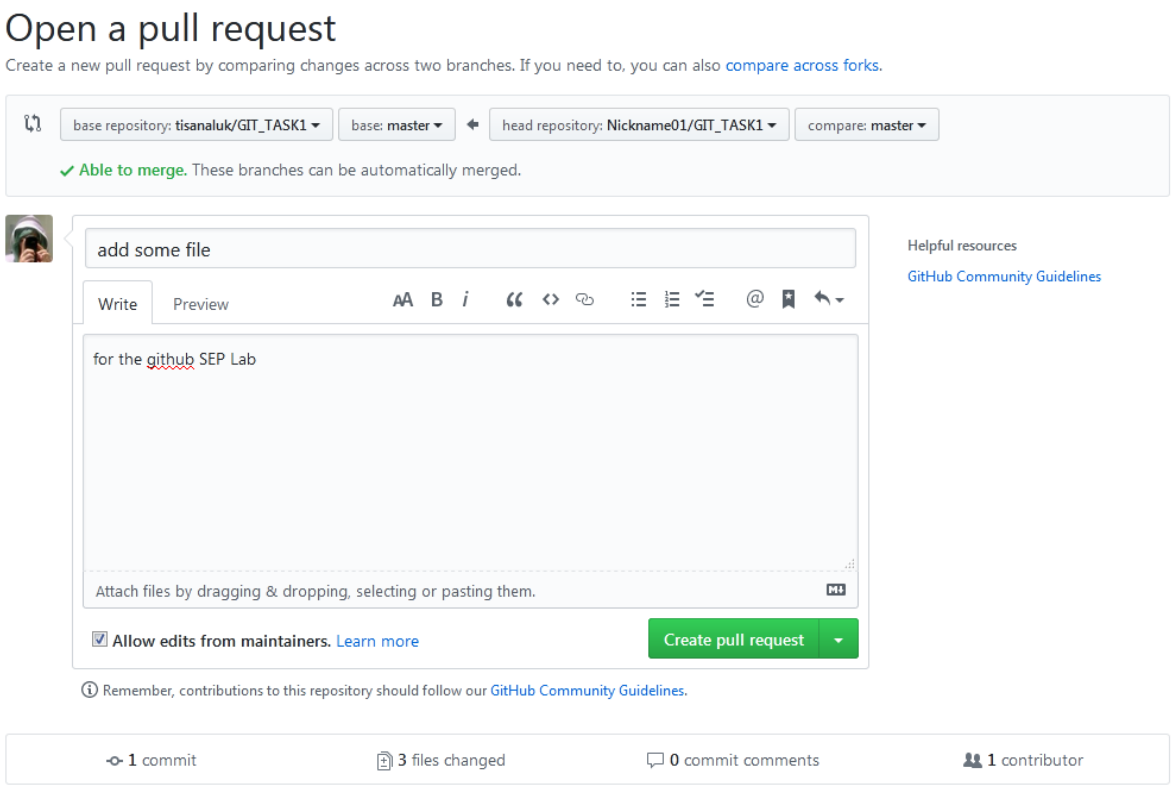

Figure 15 pull request window with "Send pull request" button

After the pull request has been sent from you colleague, the pull request will be notified at Pull Request notification window (Figure 16).

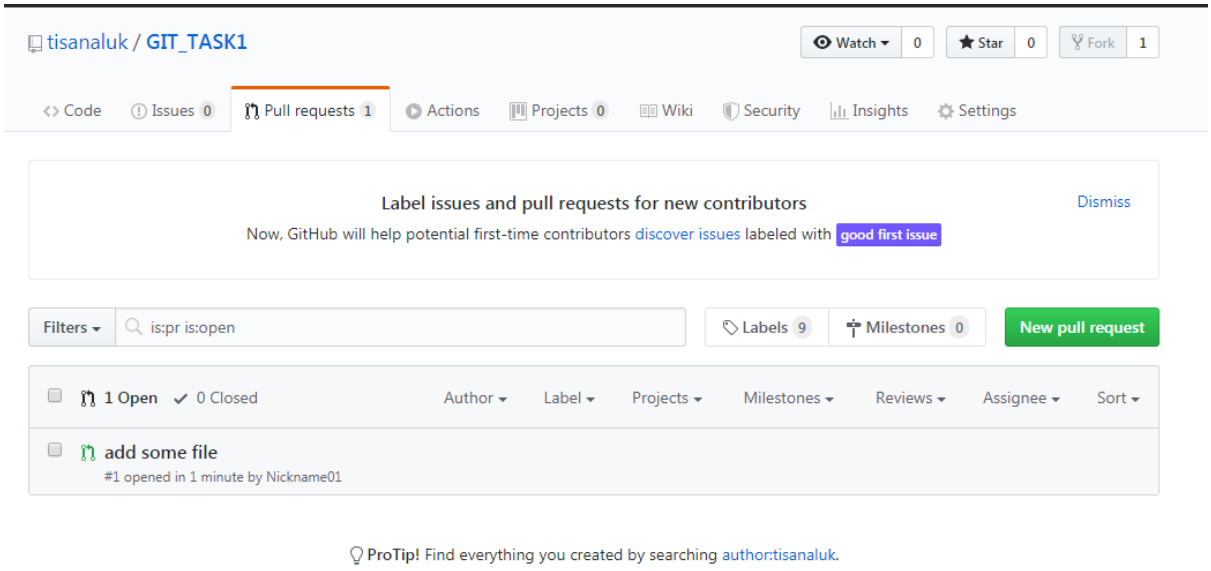

Figure 16 Pull Request notification window

If you approve the actions that are contained on the pull request, you can click "Merge pull request" button (Figure 17), and afterwards you can confirm the action by clicking "Confirm Merge" button (Figure 18). You can update status on your computer by “Push origin”. button (Figure 19).

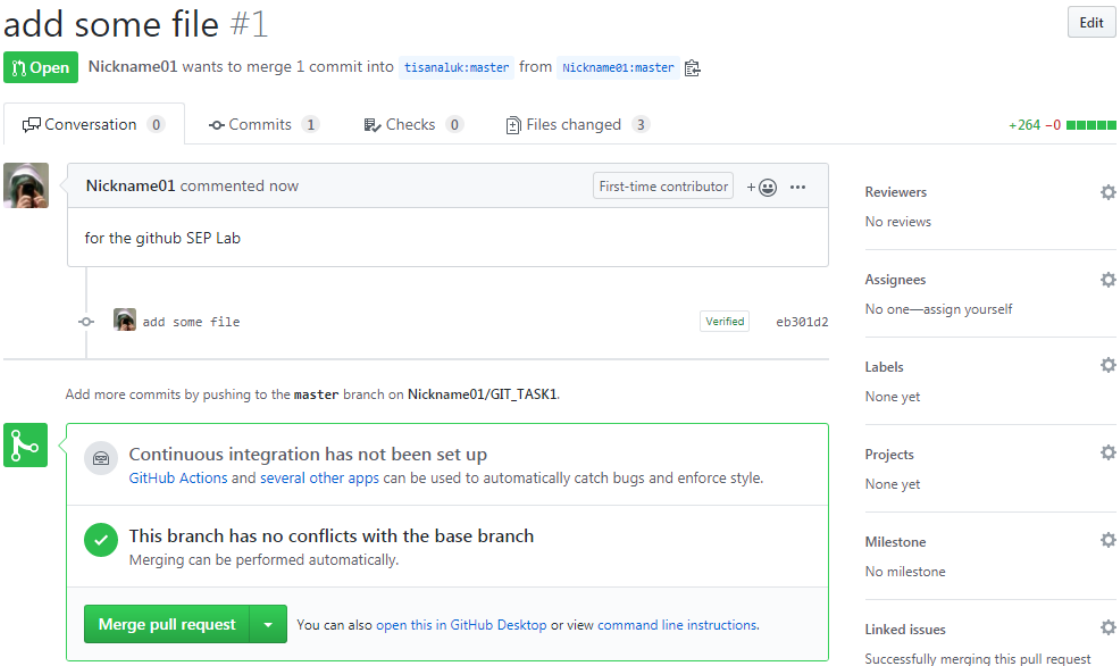

Figure 17 "Merge pull request" button

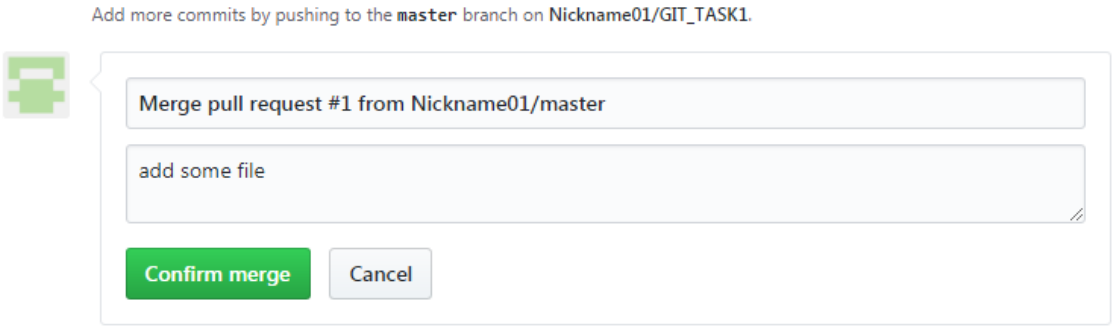

Figure 18 "Confirm Merge" button

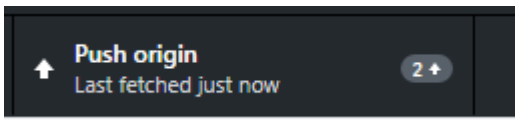

Figure 19 " Push origin" button

- Sharing with your friends

One of the great features on GitHub is the ability to see what other people are working on and who they are connecting with. When you follow someone, you will get notifications on your dashboard about their GitHub activity.
