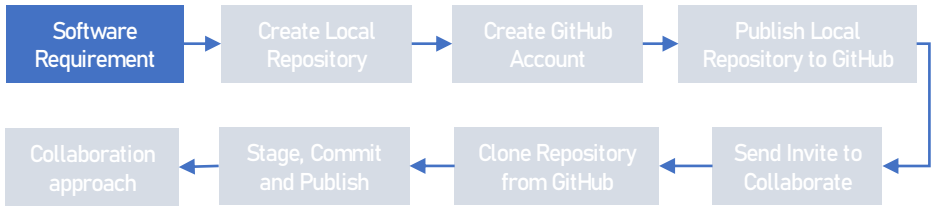
GitHub + Visual Studio Code

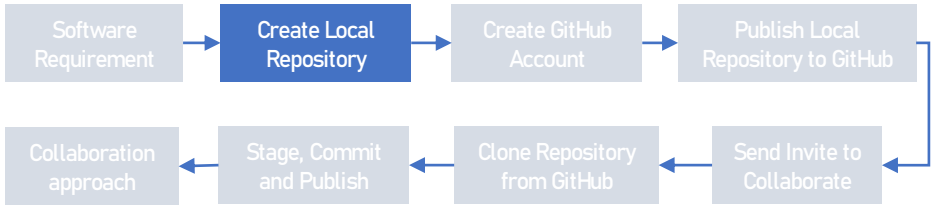
How to collaborate coding with team members



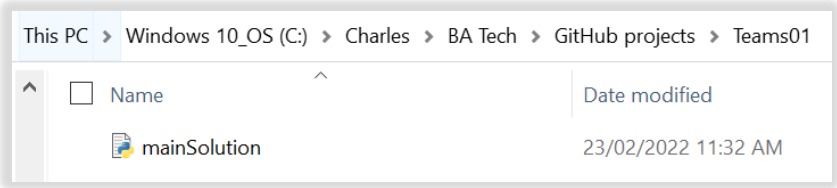
Pre-requisites

Download and install if you do not have following software

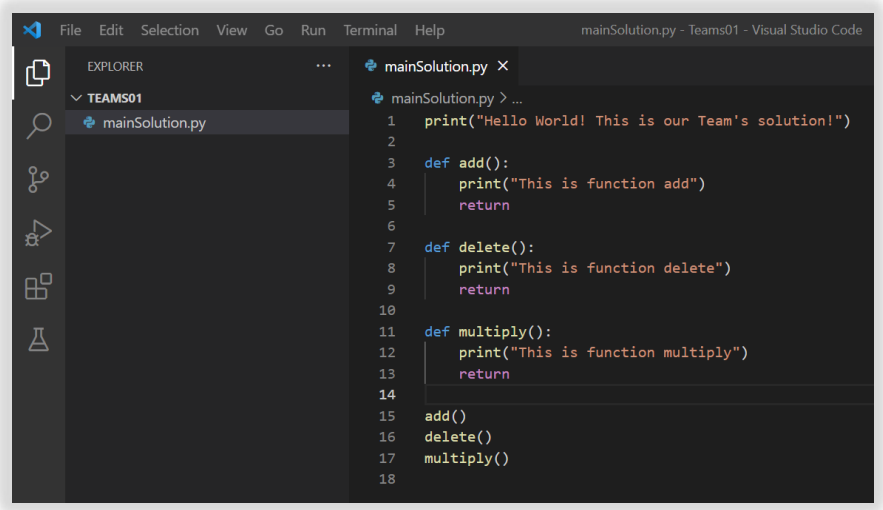
1. Git https://git-scm.com/
2. Python https://www.python.org/downloads/
3. Visual Studio Code https://code.visualstudio.com/download

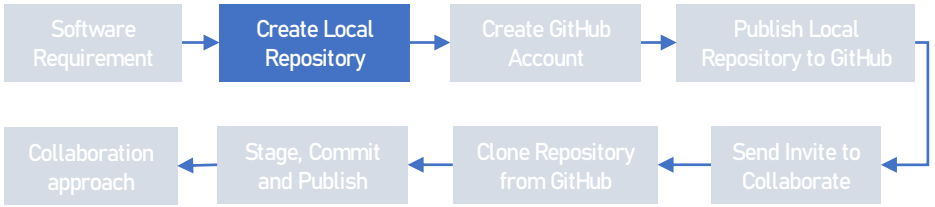


1. Create a project folder and store your files into the folder. In the example below, a folder Teams01 was created and stores the project python file named mainSolution



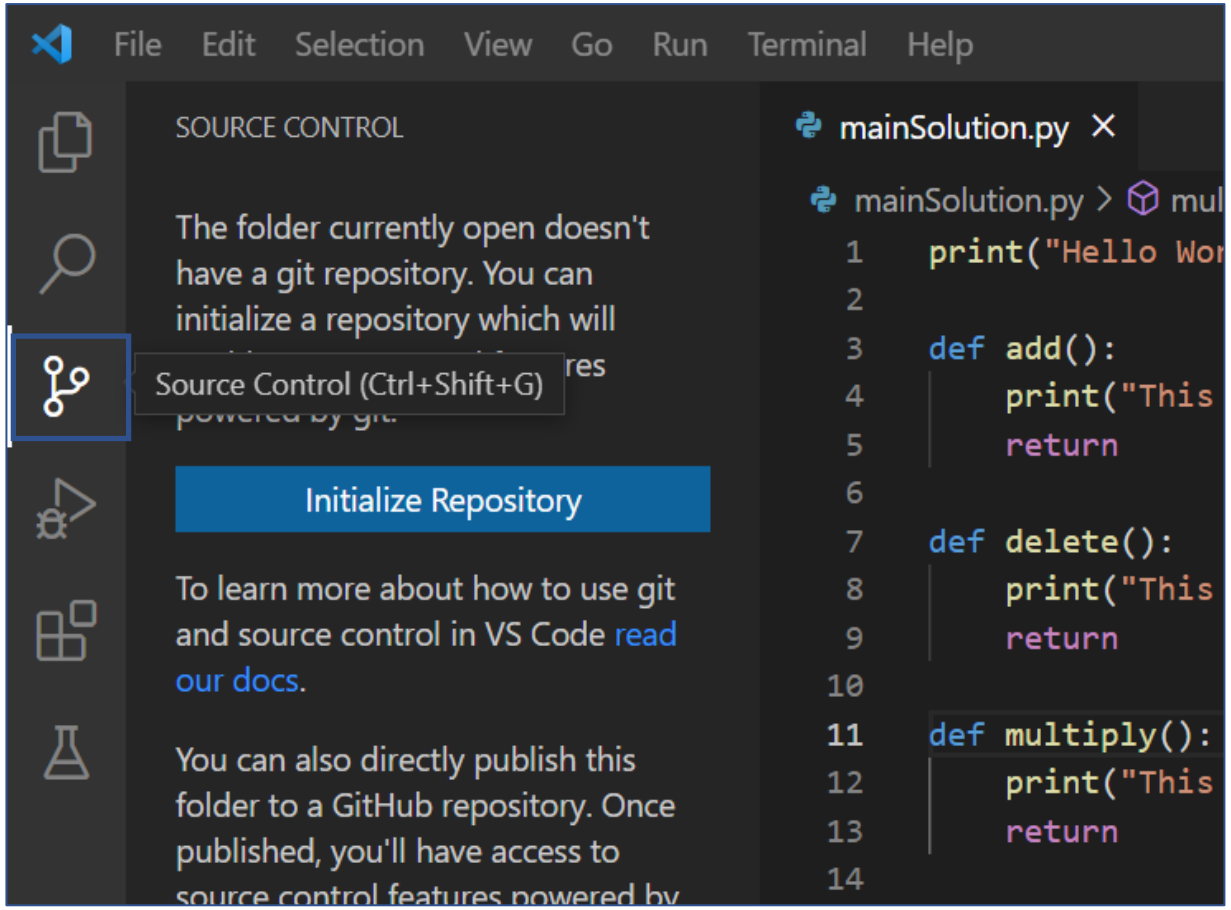
2. Launch Visual Studio Code and navigate to the folder you have created. In this example, the mainSolution.py contains the skeleton of the project, with the all the required functionalities defined (add, delete, multiply)

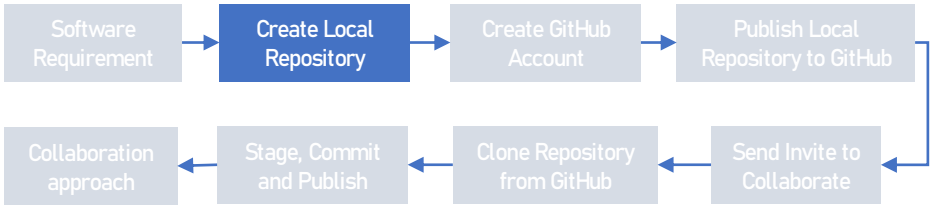




3. Select Source Control at the left panel or press Ctrl+Shift+G, then select Initialize Repository

Source Control





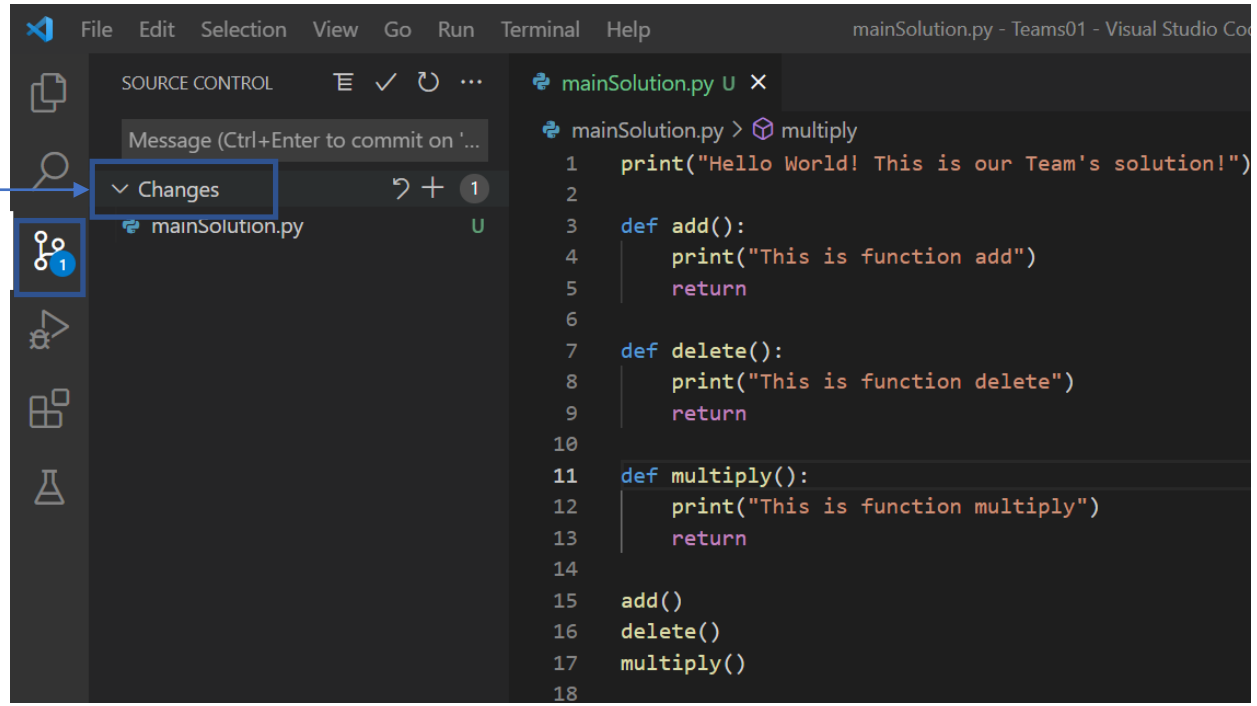
4. After repository is initialized, you will see an expandable list Changes.

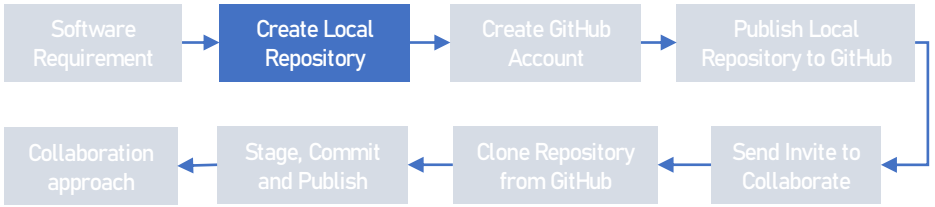
In our example there is only one file, mainSolution.py, inside this list. The letter u located on the right-hand side of file mainSolution.py indicates that it is untracked or not tracked by Git.

Because this repository was just initialized, the file(s) inside are considered to be changes made to this repository. This number shows that there is 1 pending changes in our case.

Changes

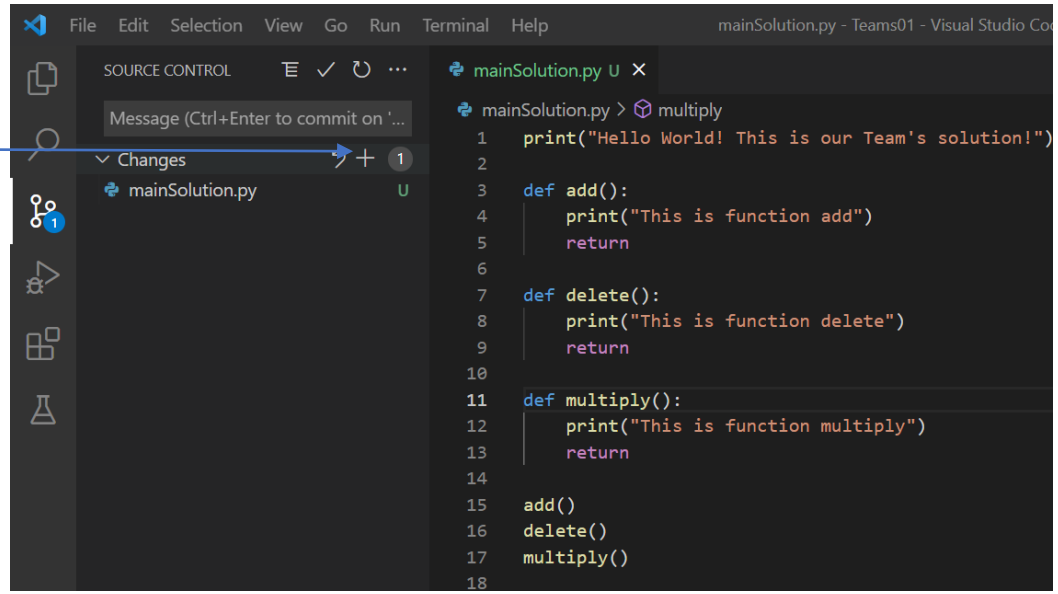
1 pending changes



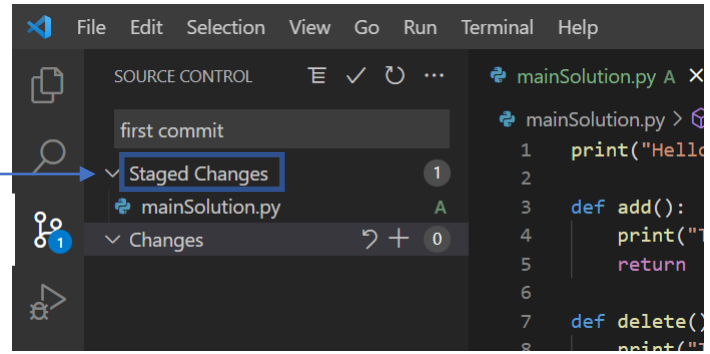


5. Select expandable list Changes and click on the + sign to stage all changes.

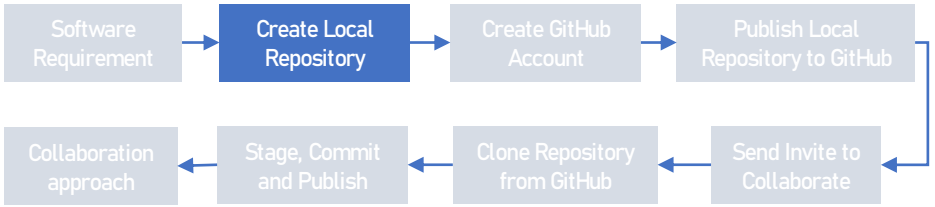
+ sign



6. You should then see that Staged Changes appears with the number of files that were staged for changes.



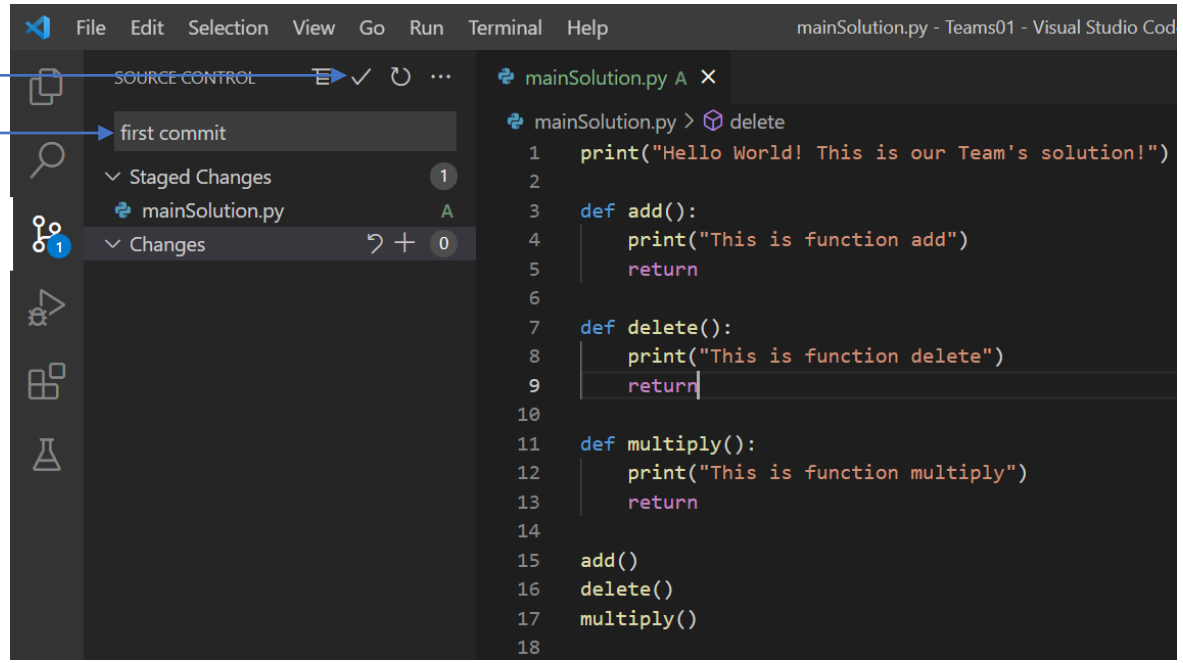
Note: Stage changes means adding all the files that have changes made to be available for Commit.



7. Enter a meaningful message inside this box describing what the commit is about. In this example, "first commit" was used.

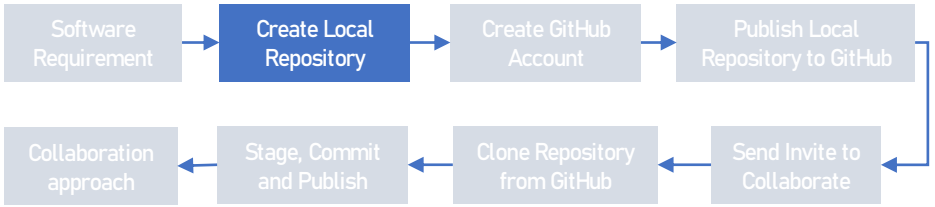
✓ sign

first commit



8. Click on the ✓ sign above to commit staged changes.

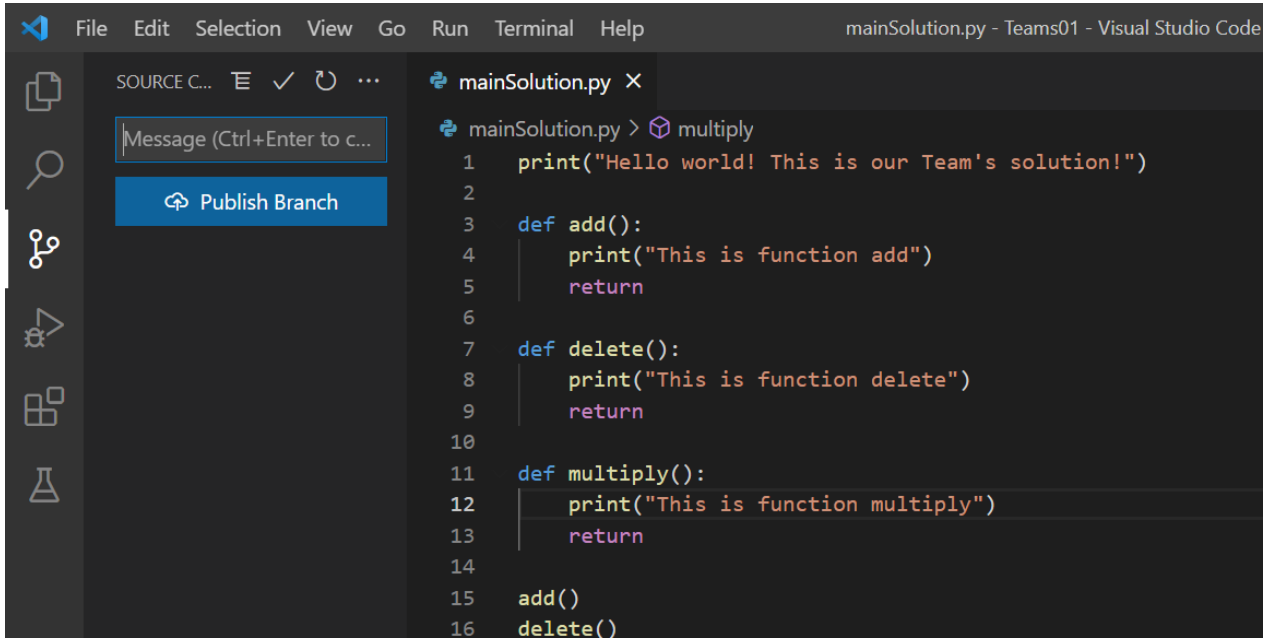
Note:
Commit captures a snapshot of the project's currently staged changes.
Committed snapshots can be thought of as "safe" versions of a project.

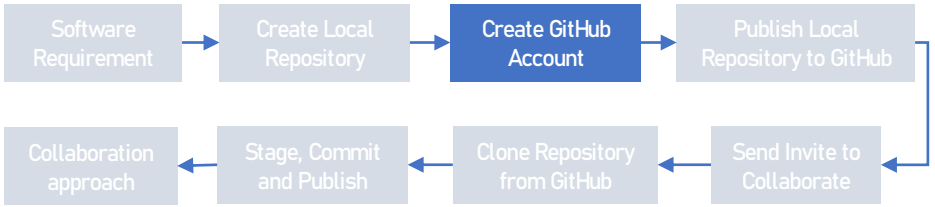


9. After your first commit, an option will be available for you to publish to GitHub.

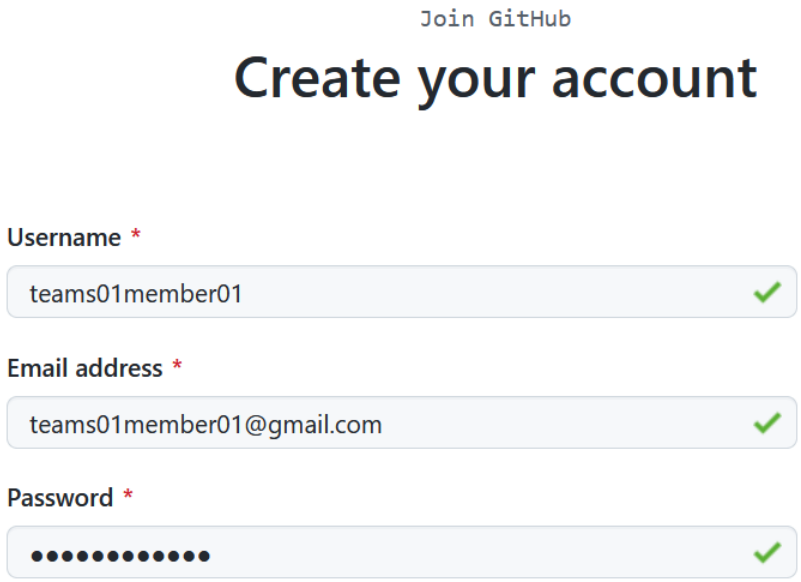
Follow steps on the next slide to set up username and user email.

<u>DO NOT</u> PUBLISH YET AT THIS POINT AS SOME PREPARATION WORKS ARE REQUIRED



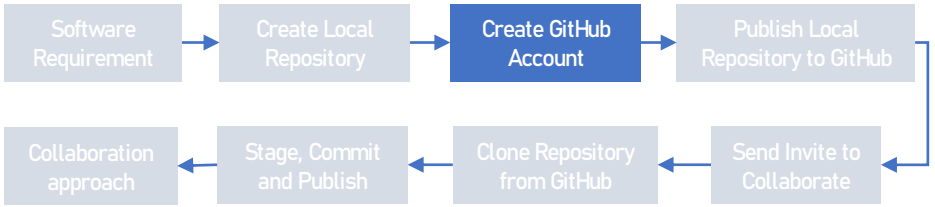


1. You need a GitHub account. If you do not have one, sign up at https://github.com/join



2. Sign-in to your GitHub account and **remain signed in**.

THIS STEP IS IMPORTANT IF IT IS THE FIRST TIME YOU ARE ACCESSING GITHUB FROM YOUR COMPUTER USING VISUAL STUDIO CODE EDITOR



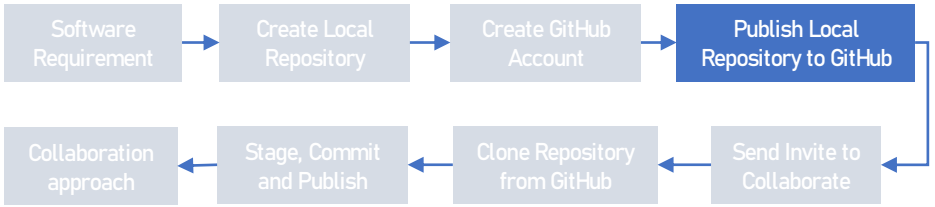
3. Setup your user.name and user.email in your local machine where Git was installed. These are the name and email address that was used when creating the GitHub account. At the powershell, enter the following commands to set your user.name and user.email.

```
git config --global user.name “<username>”
git config --global user.email “<emailaddress>”
git config --global --list
```

The last command list the user.name and user.email to verify that the info entered were correctly stored inside Git.

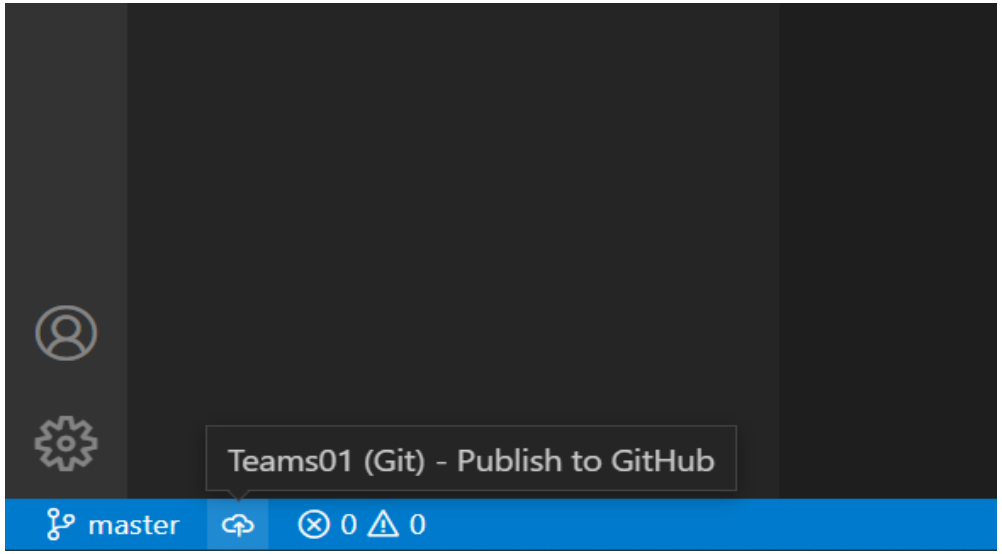
shortcut keys to powershell terminal **CTRL + ~**

At terminal, setup your user.name and user.email

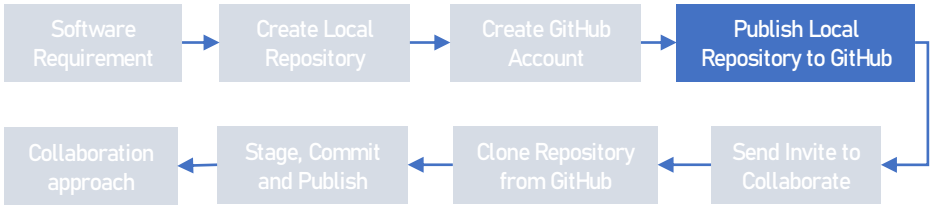


1. At the bottom left-hand side of VS Code, mouse over the cloud icon and you should see your project folder name (Teams01 in this example), followed by (Git) – Publish to GitHub.

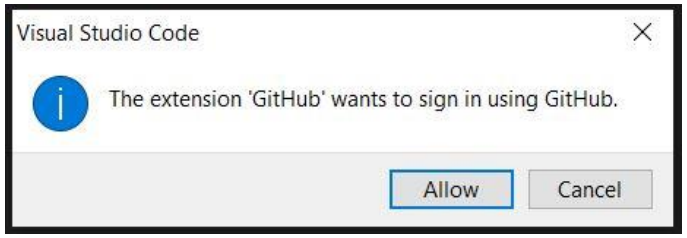
Click to Publish to GitHub.



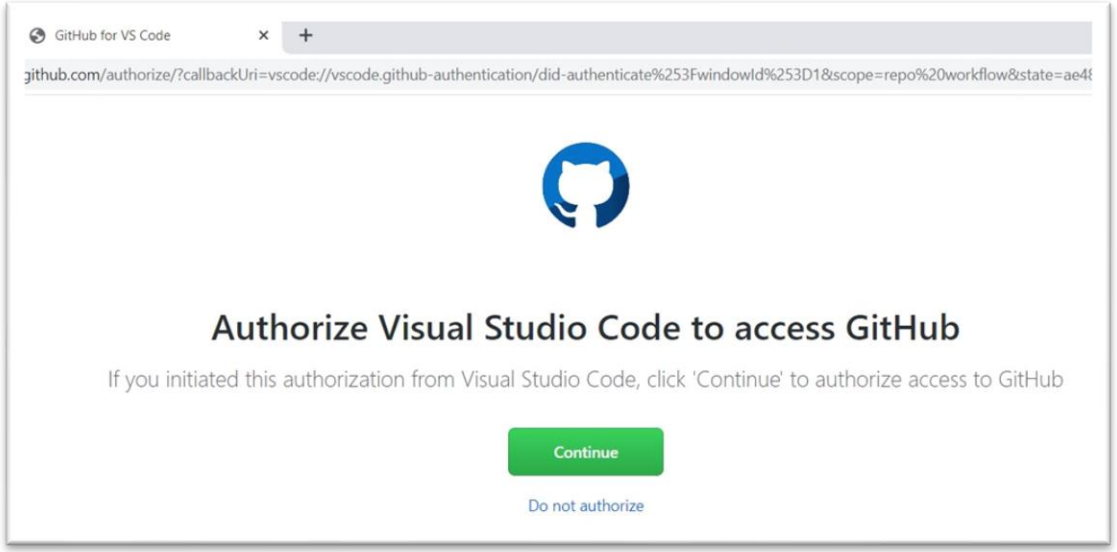
cloud icon

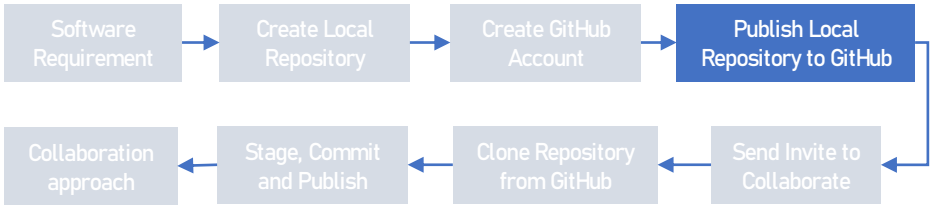


2. This dialog will pop up. Click on “Allow” for extension to sign in using GitHub

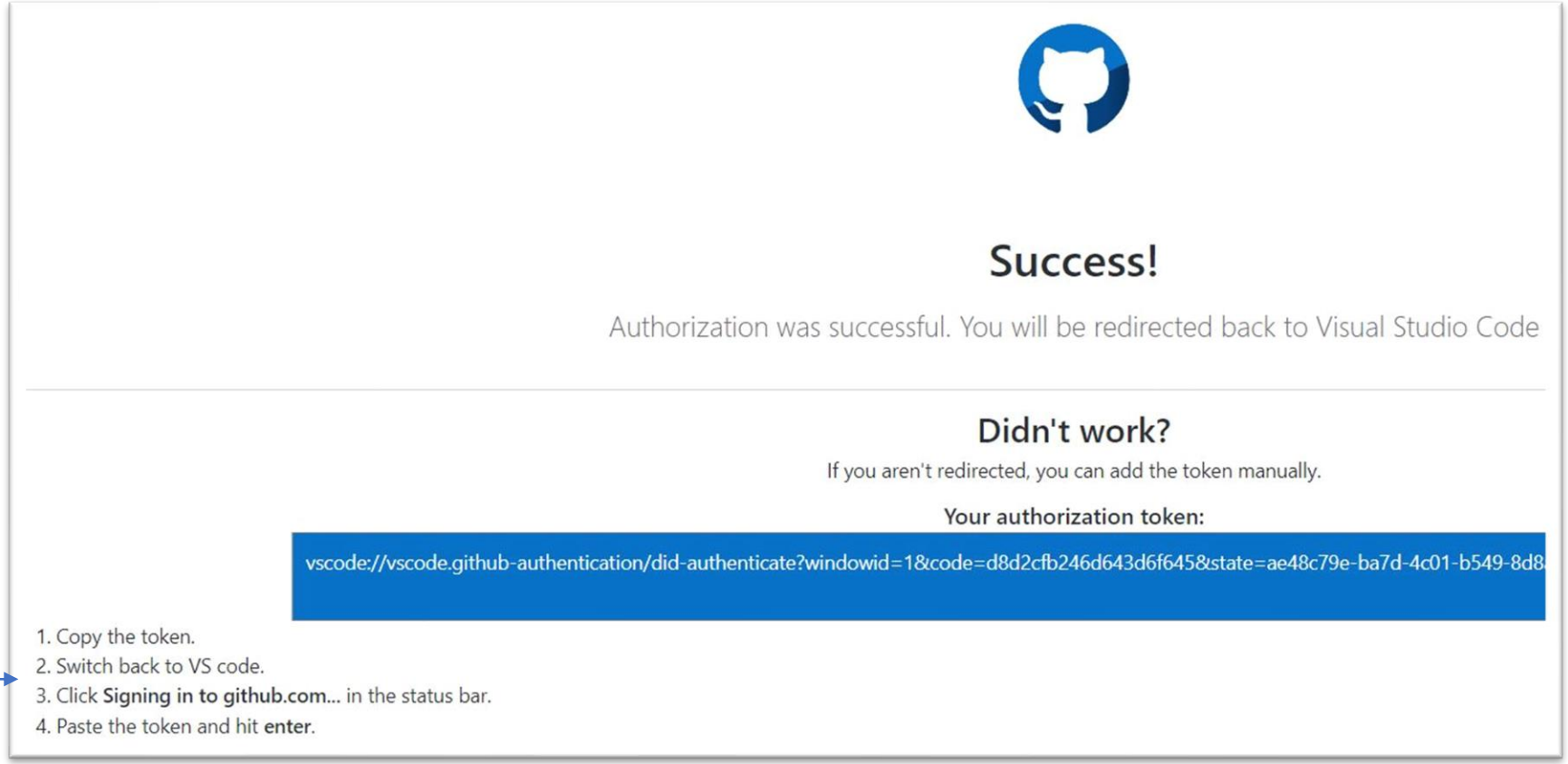


3. You will be directed to this website. Click on “Continue” to allow VS Code to access GitHub

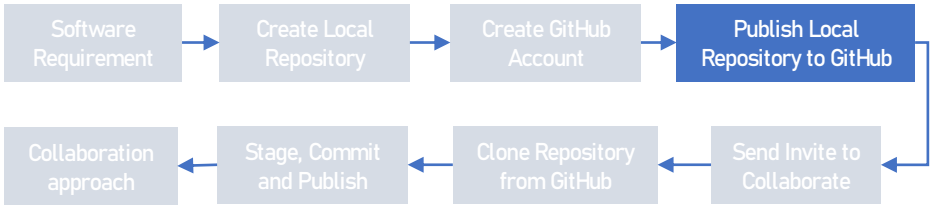




4. You should see the following screen that directed you back to VS Code editor.



If it didn't work, follow these instructions

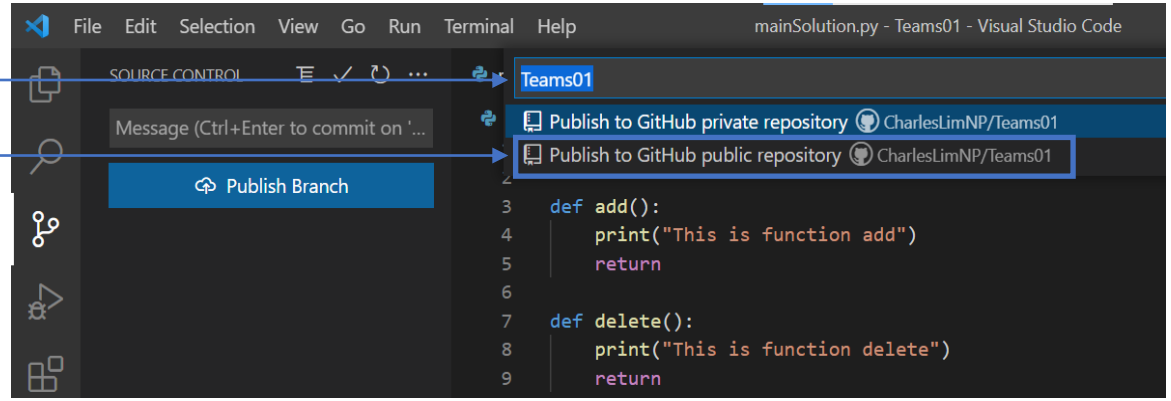


5. The remote repository name, by default, will be the same as your folder name.
Teams01 appears as in this example which means this repository name is available for use. If a name is already in use, you will have to use another available name.

Select Publish to GitHub **public** repository@....

Repository name Teams01

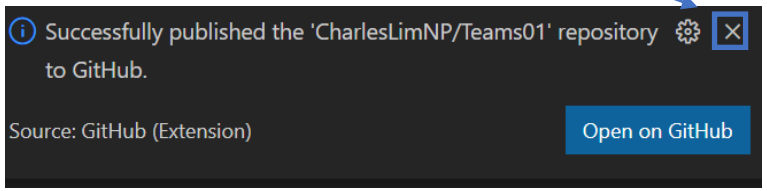
Publish to public repository

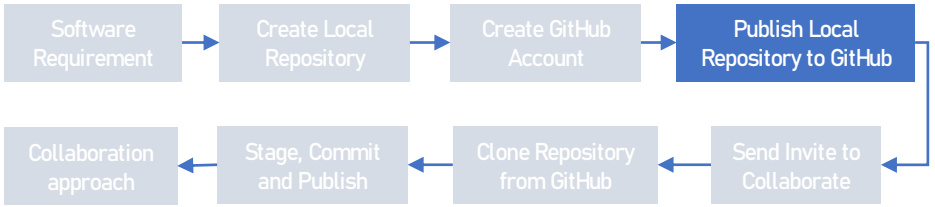


6. If this is the first time you are accessing GitHub using VS Code, this dialog box will appear for you to login and authenticate.
Key in your credentials to login in order to progress with publishing to a remote repository.

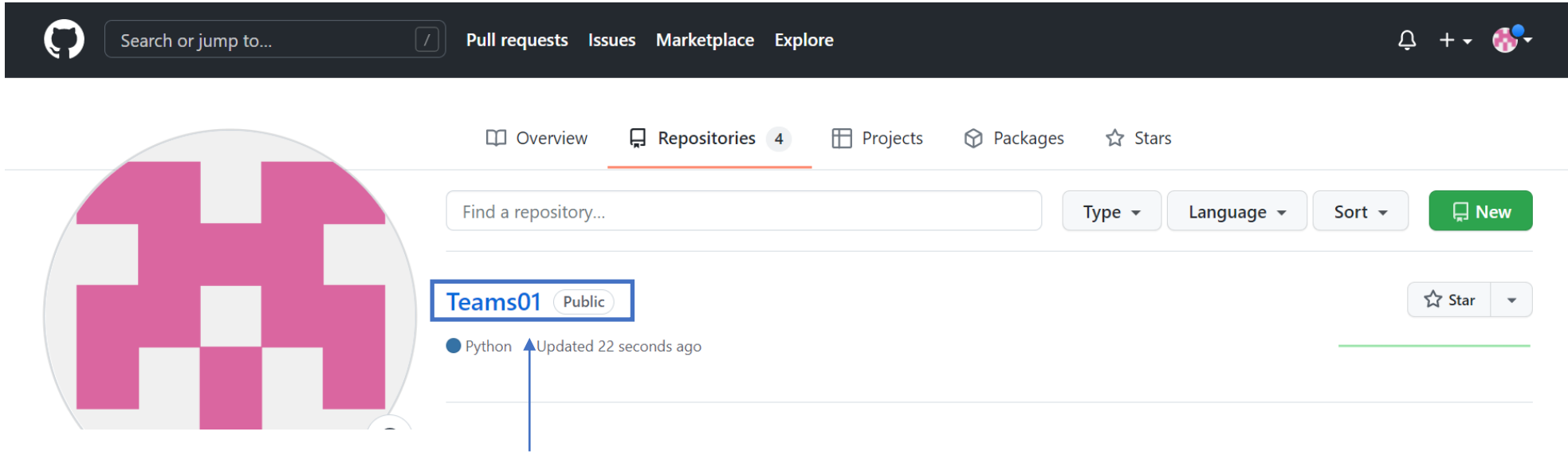
close dialog

7. You should see this dialog box after it was successfully published to the remote repository. Go ahead to close it.

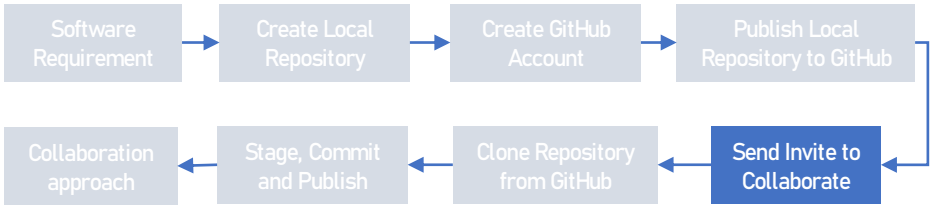




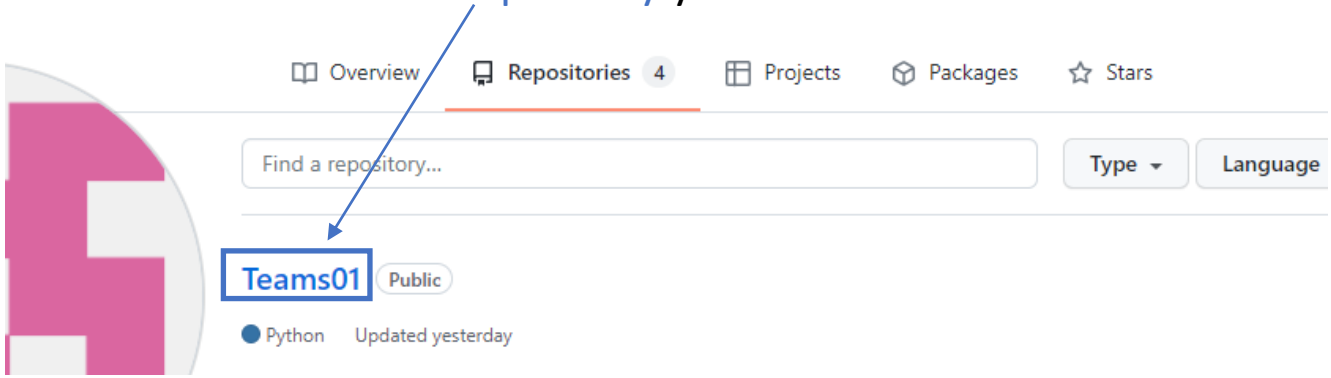
8. Refresh your browser that was signed in to GitHub and you should see that a new public repository Teams01 was created.



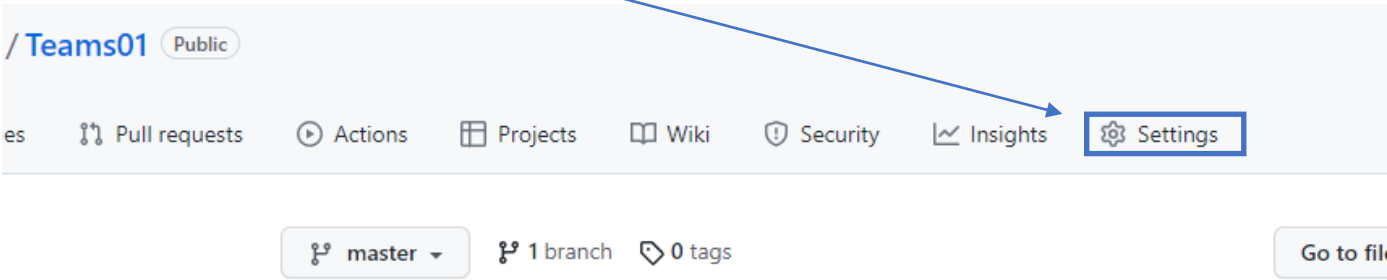
new public repository

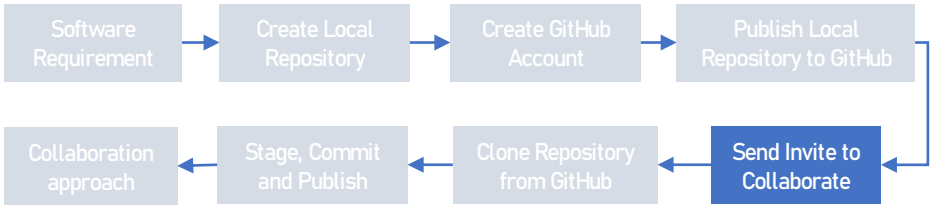


1. Click to select the repository you wish to invite collaborators

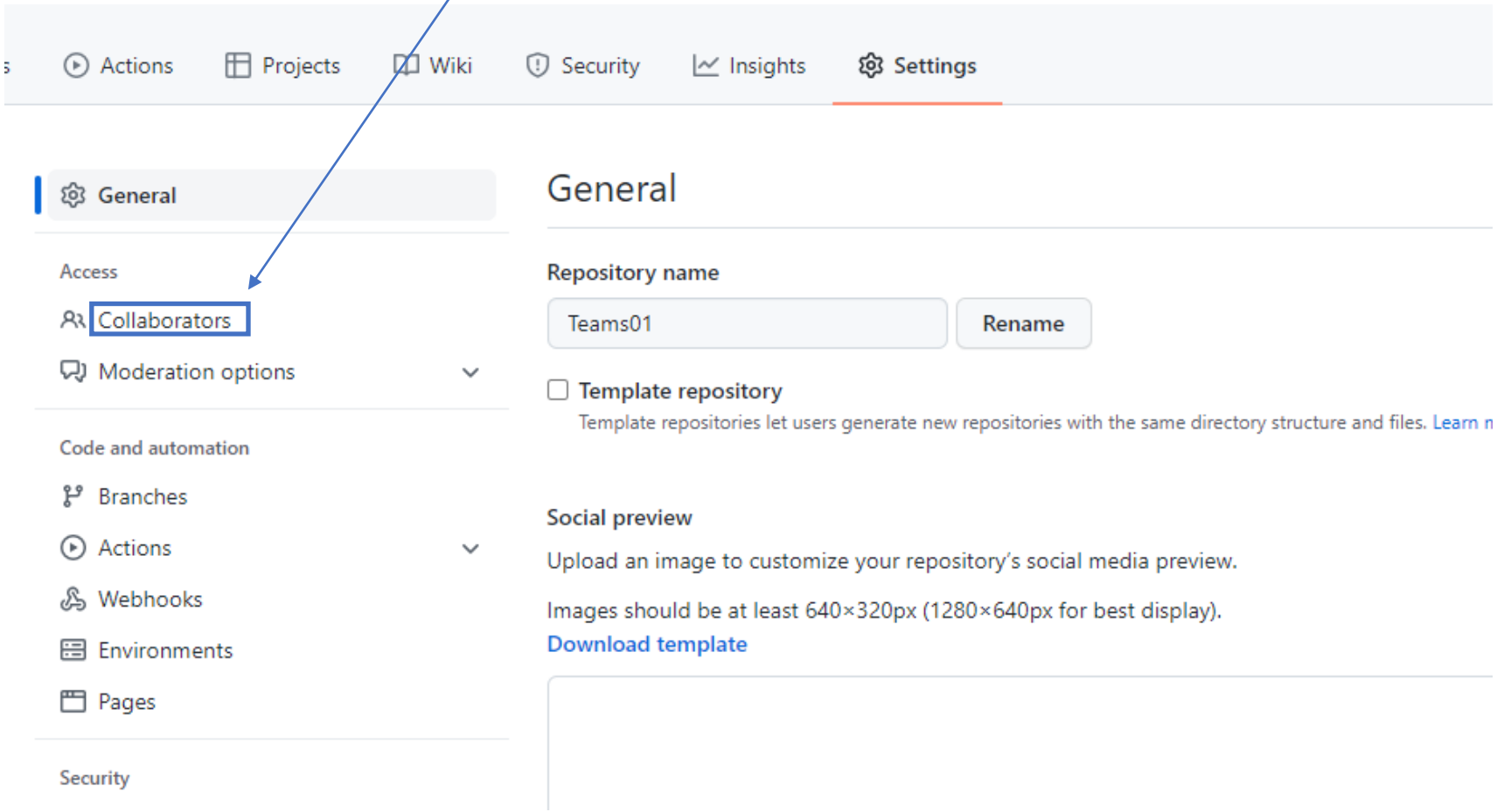


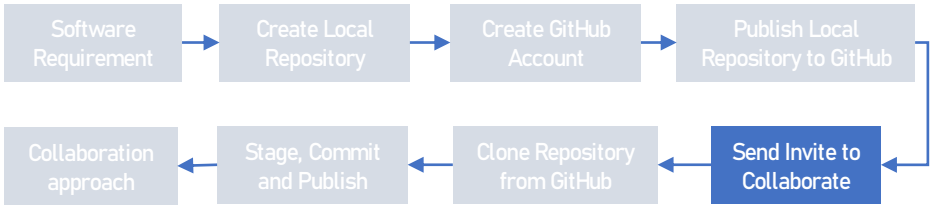
2. Click on Settings



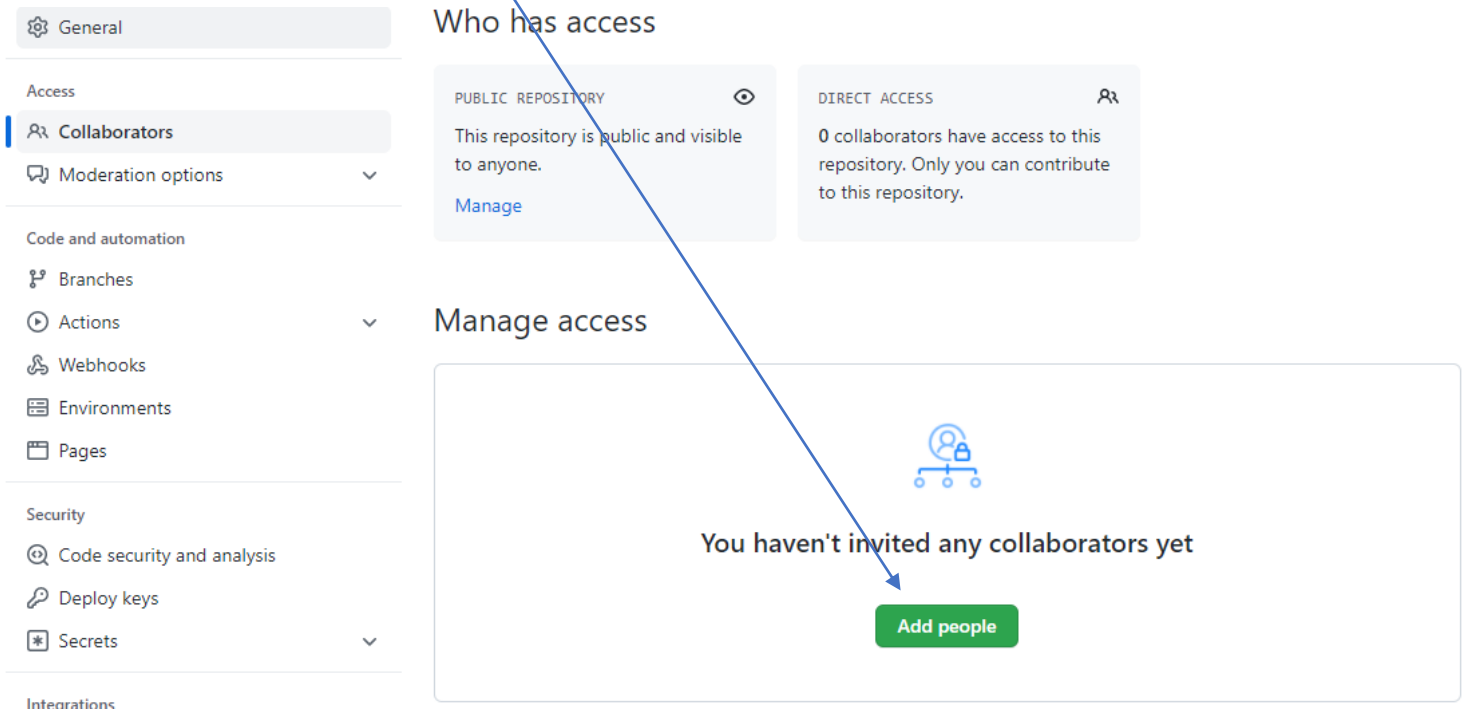


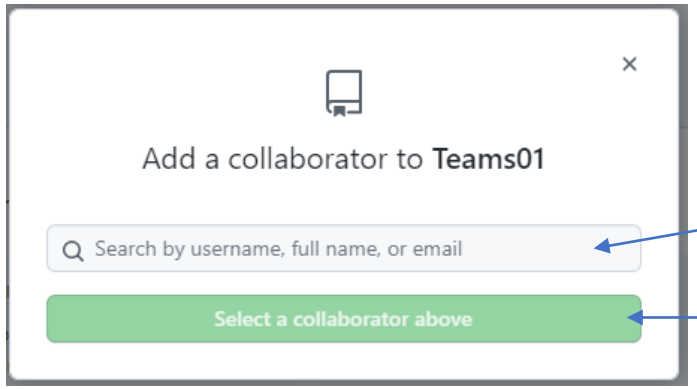
3. Click on Collaborators





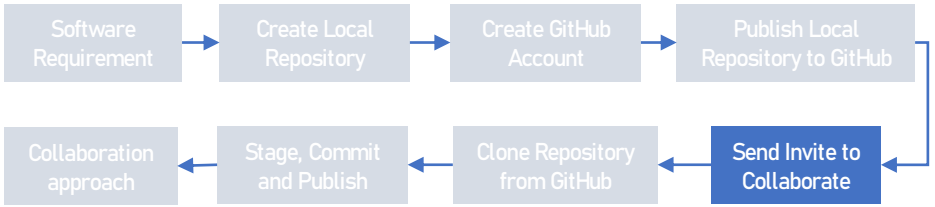
4. Select Add people



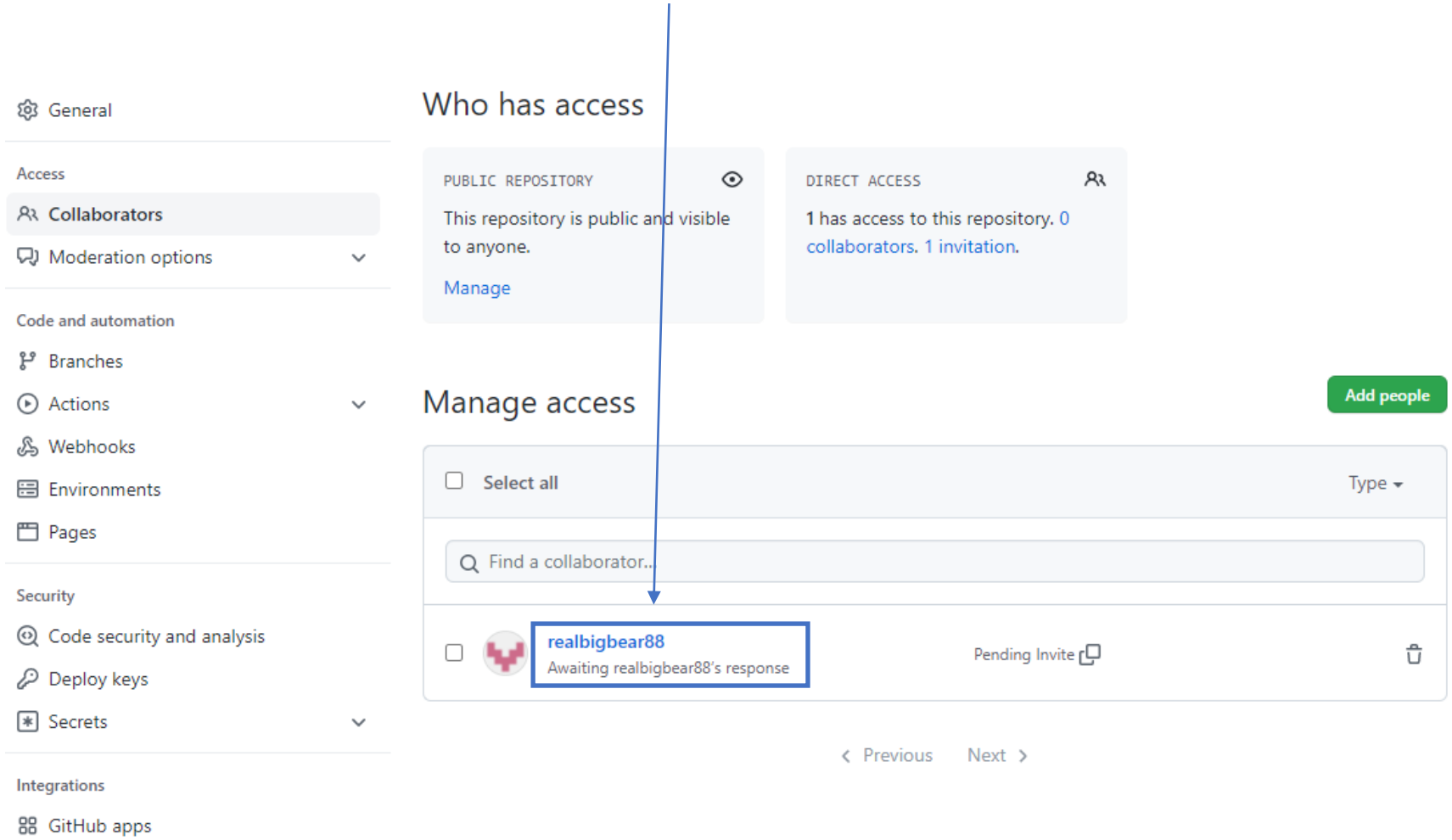


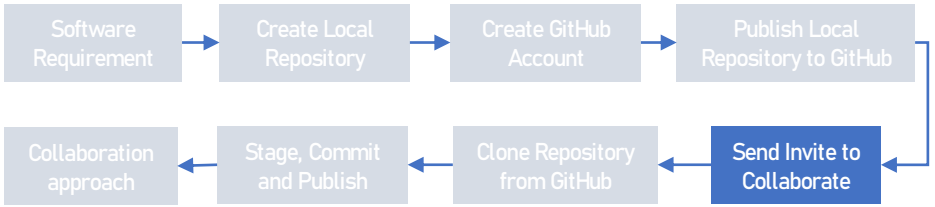
5. Enter the username or email address inside this box.

6. Click on Select a collaborator above to continue.
This will send an invitation notification to the user.



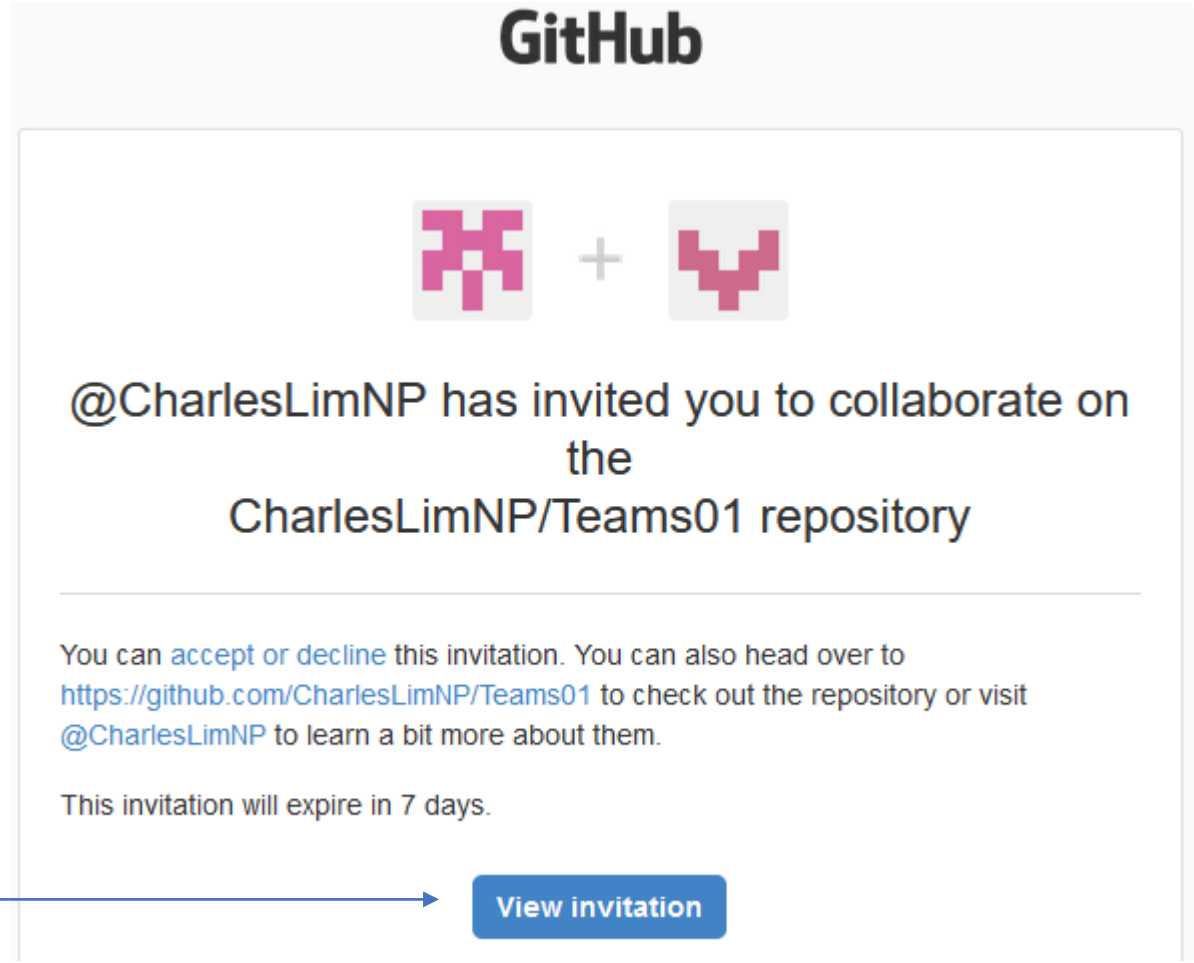
7. An invitation was sent, pending user's acceptance within 7 days, otherwise it will expire.



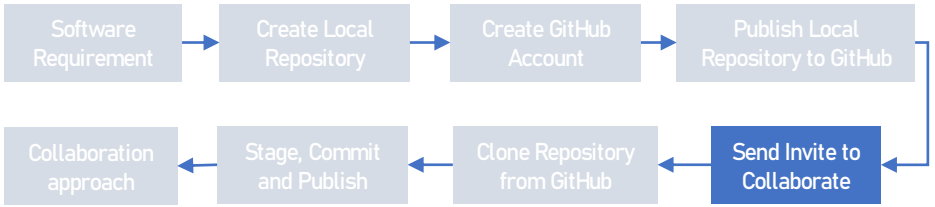


8. Collaborator should receive an invitation via email that looks like this.

Click on View invitation to proceed

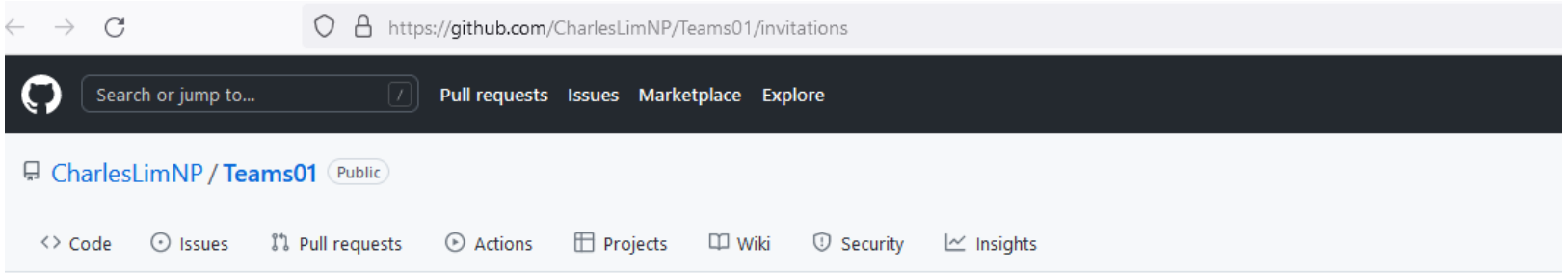


View invitation

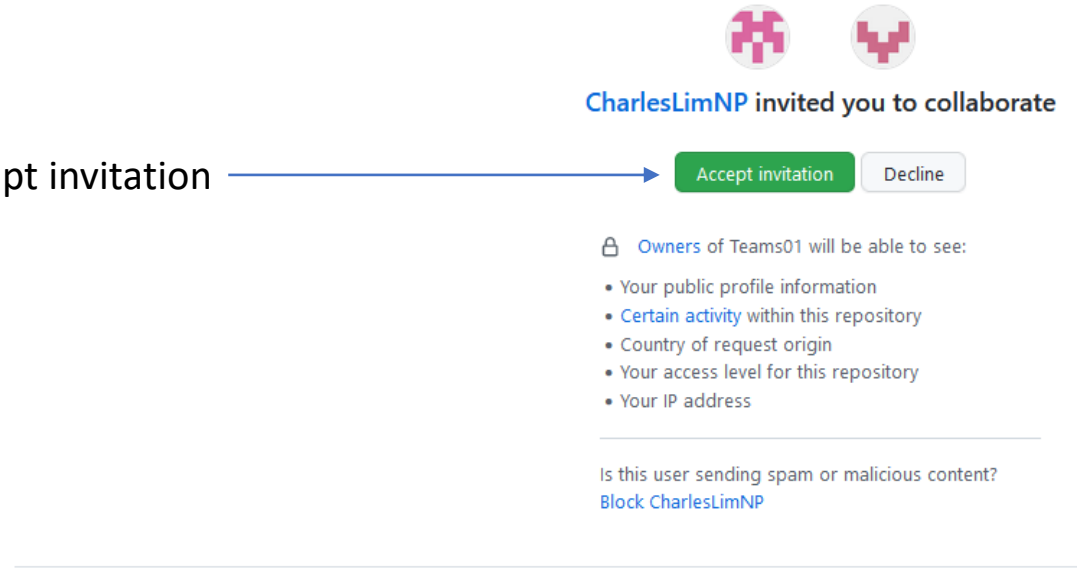


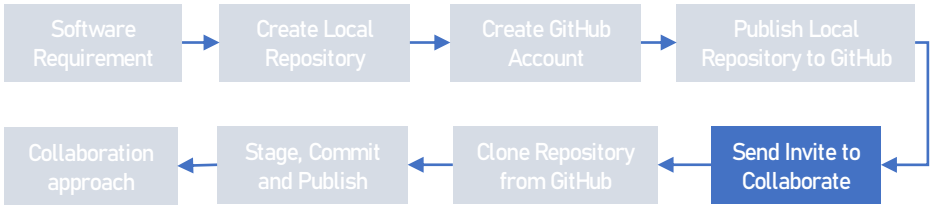
9. You will be directed to GitHub.com to view the invitation. Proceed to Accept invitation.

If you are not already logged in to GitHub, you will be prompted for user name and password to proceed.

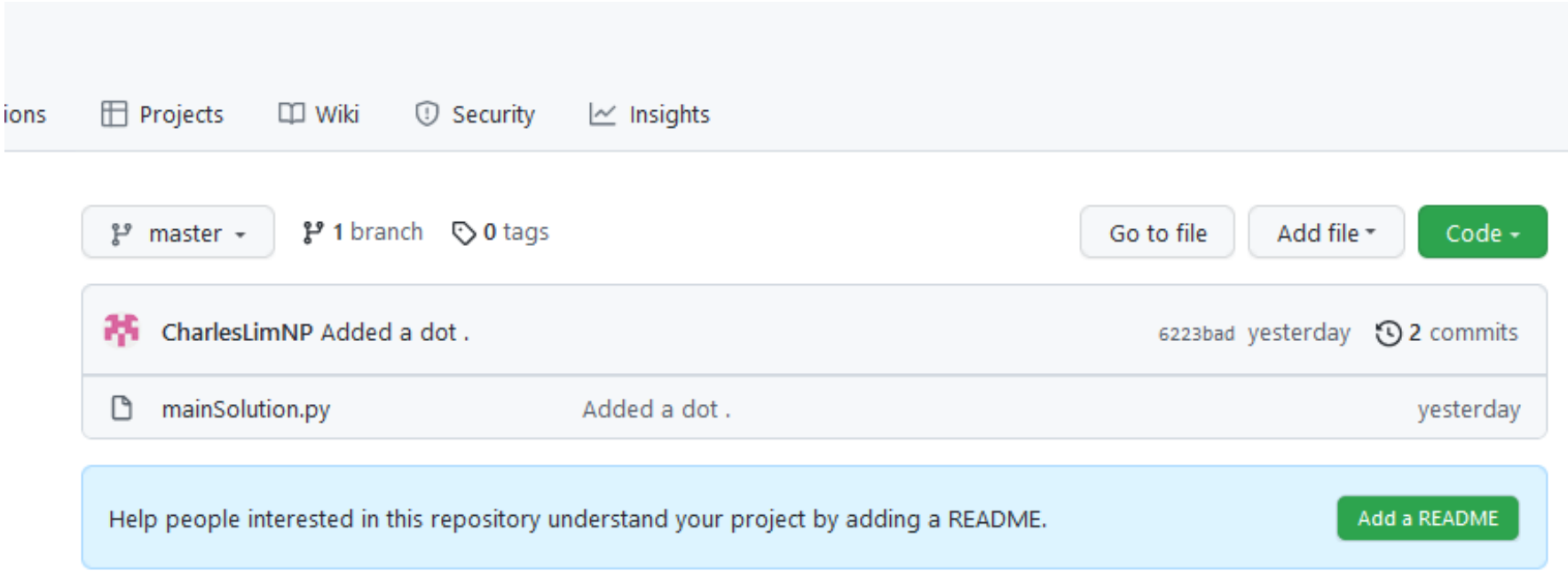


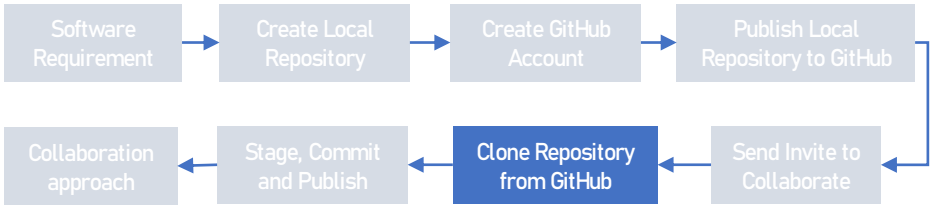
Accept invitation





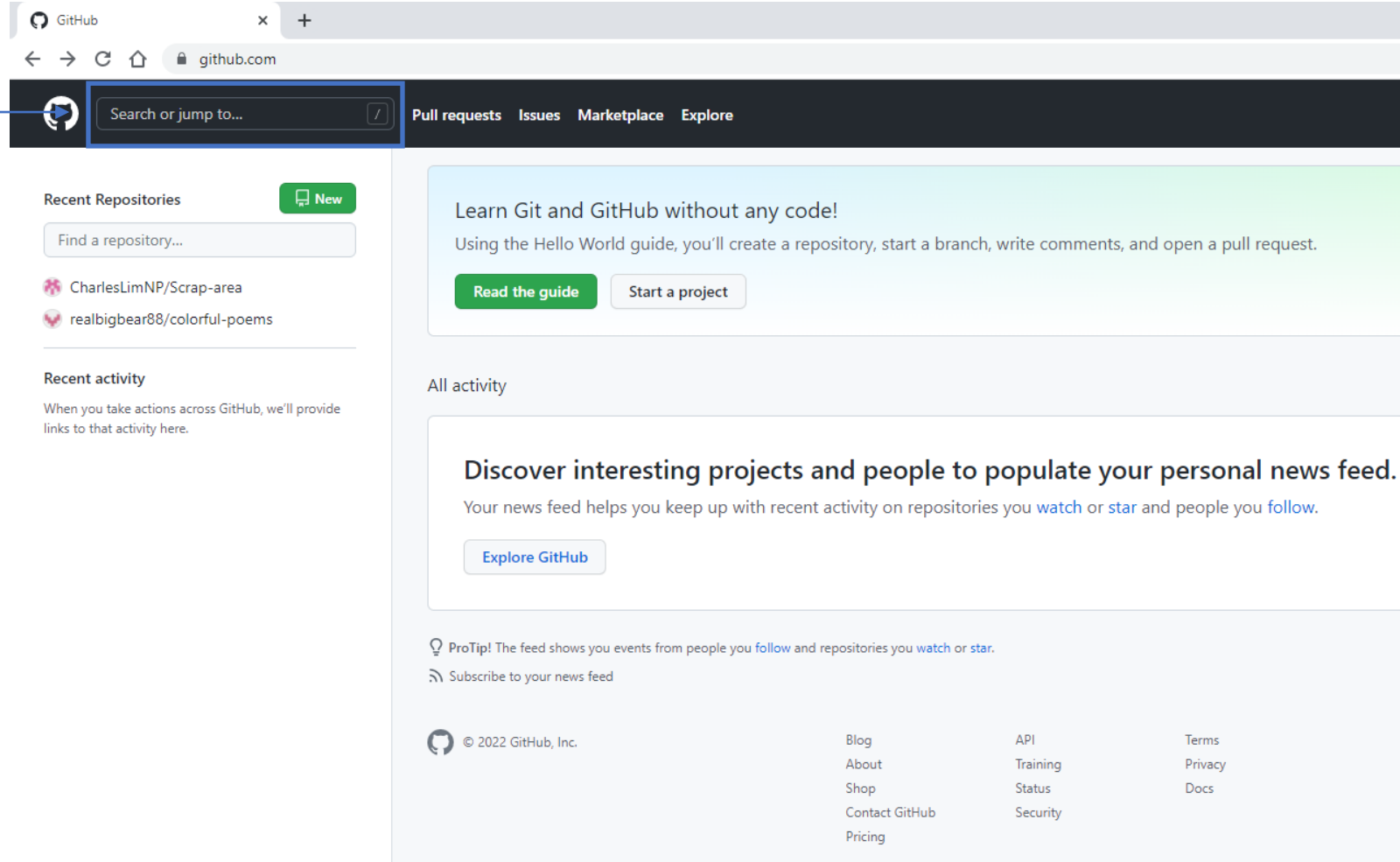
10. You should be able to access all the files and any folders that that are available inside this repository that was shared with you.

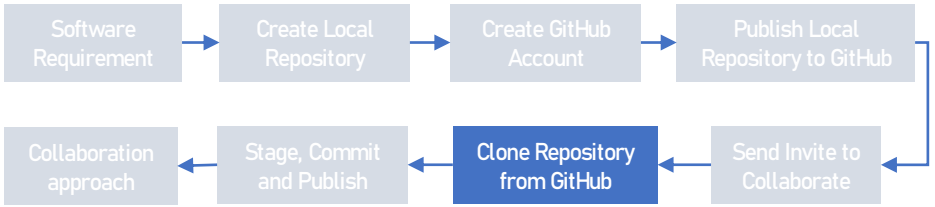




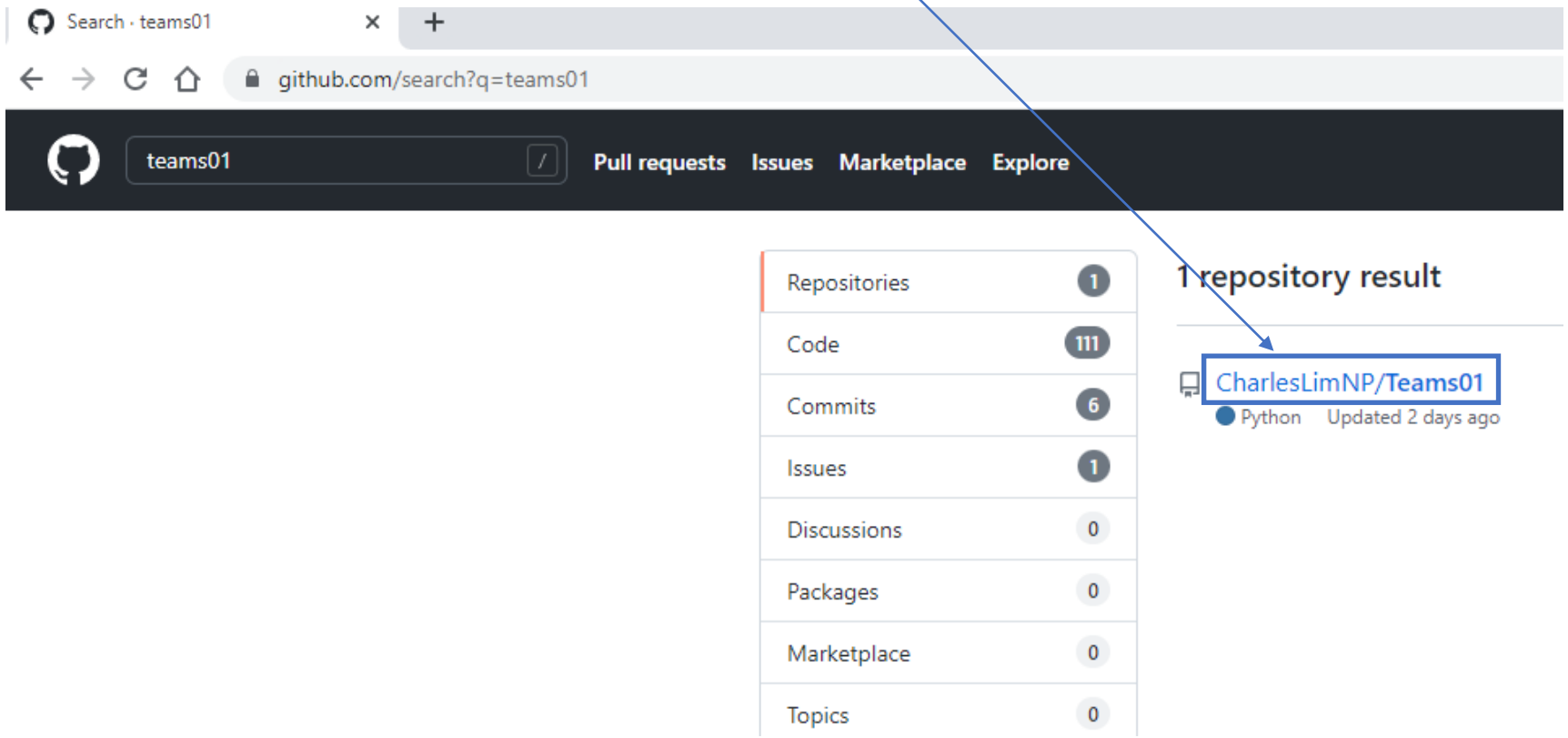
1. Sign in to GitHub and type the name inside here to search for the repository that was shared with you.

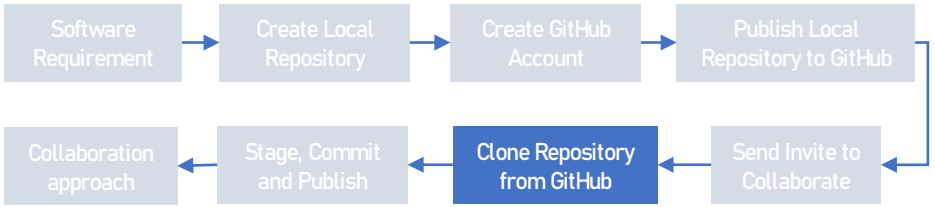
Search for a repository by typing in the name of repository here



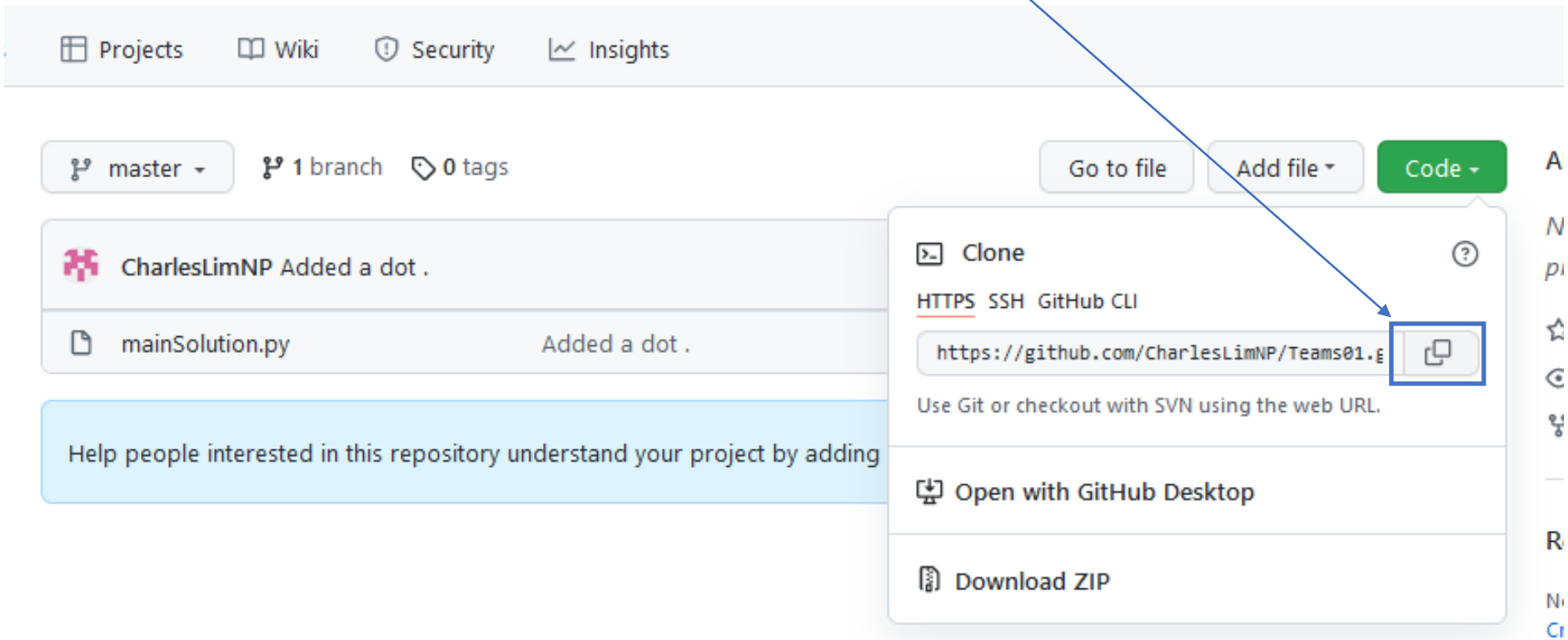


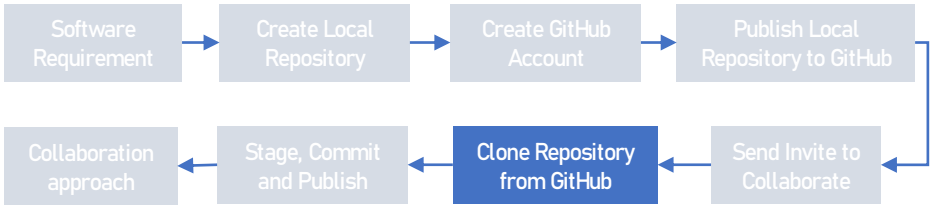
2. In our example, Teams01 was the targeted repository. Click on Teams01 to open repository.





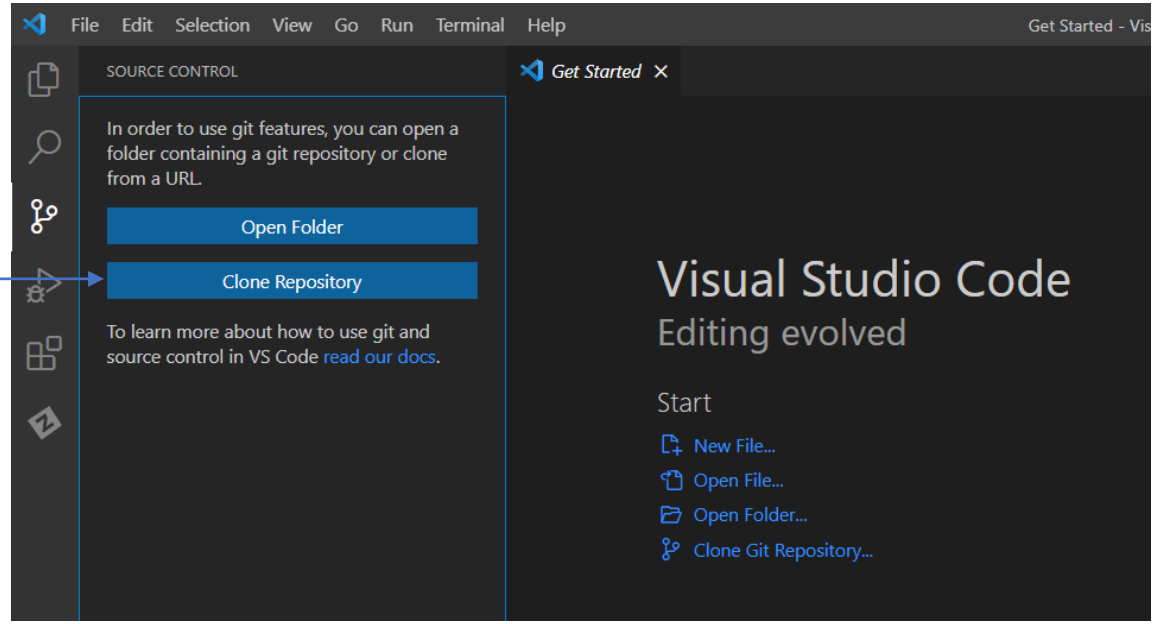
3. Select the Code dropdown list and click here to copy the URL link to this repository.

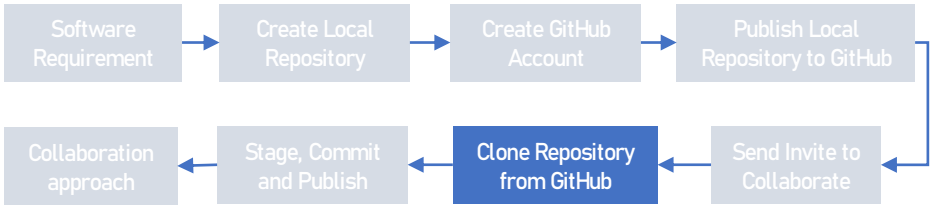




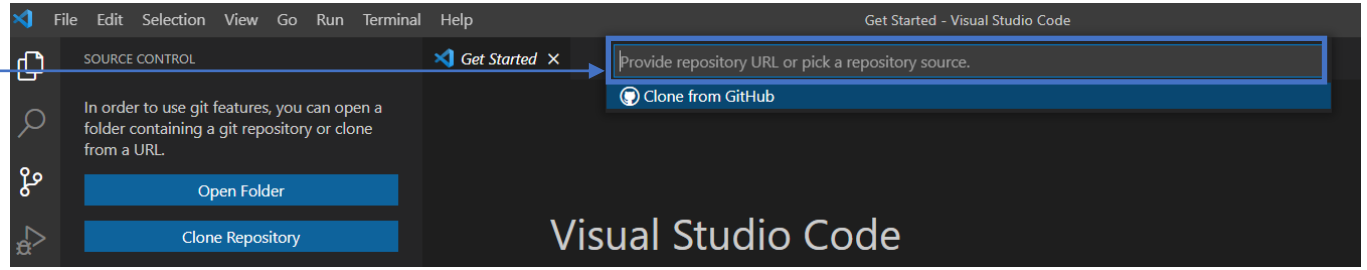
4. Launch Visual Studio Code. If there is already a folder opened, close the folder. Click on Clone Repository

5. If there is already a folder opened, close the folder. Click on Clone Repository

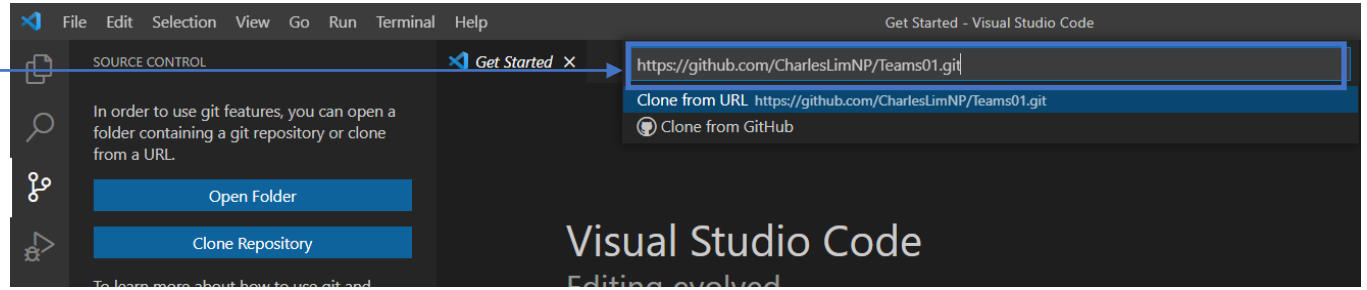


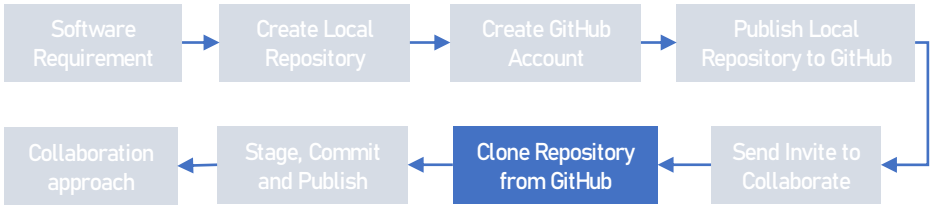


6. An input box will appear for you to provide repository URL or pick a repository source.



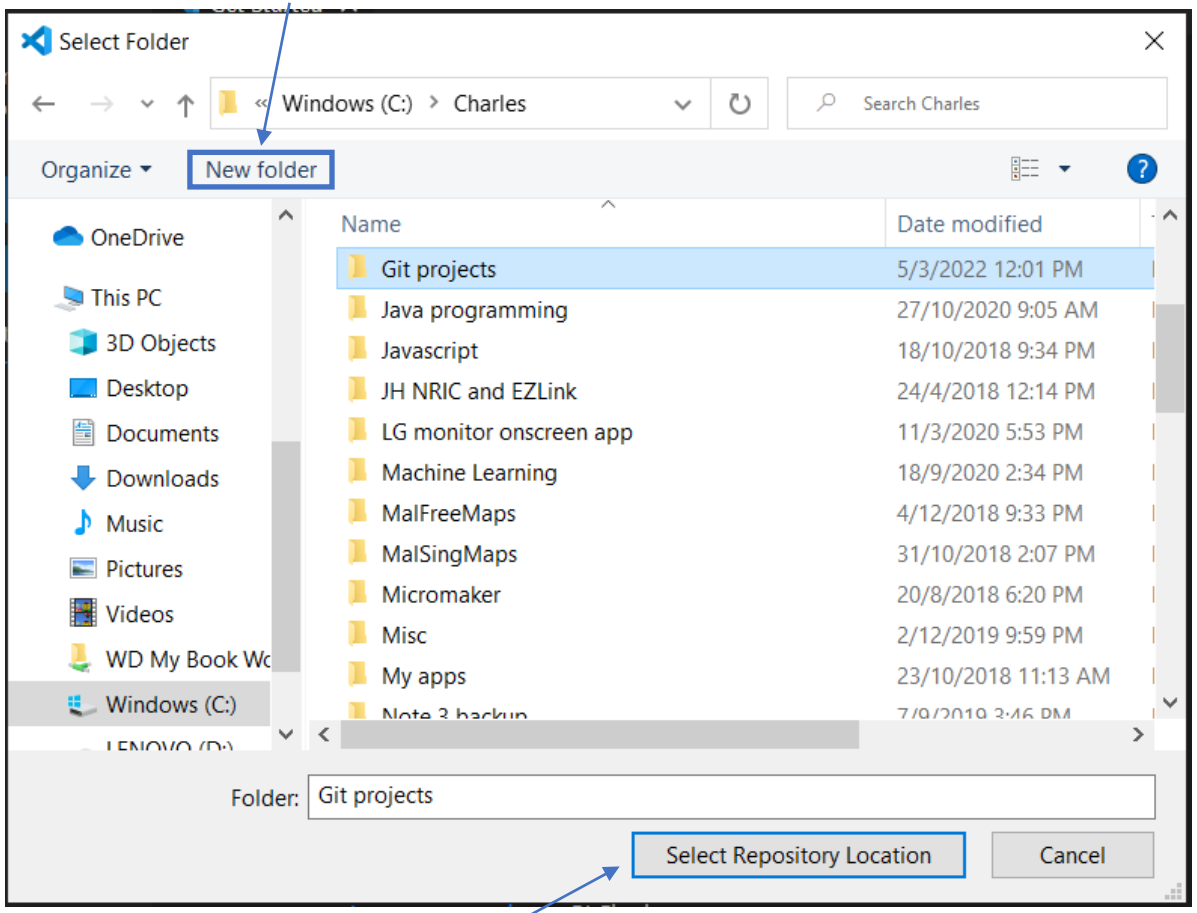
7. Paste the URL of the repository you have copied into the box and hit enter.



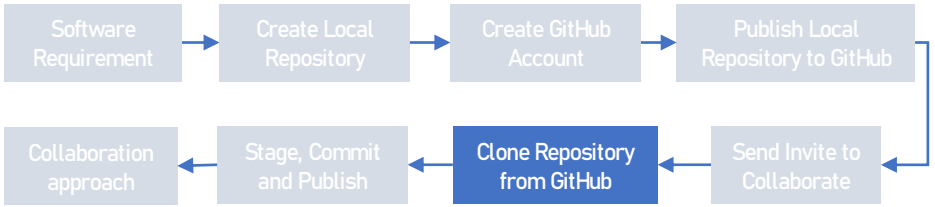


NOTE: During cloning, a new folder will be created with the name Teams01 which is similar with the remote repository's name.

8. You will be prompted to select a folder as destination to clone the repository. If required, you could create a New folder.

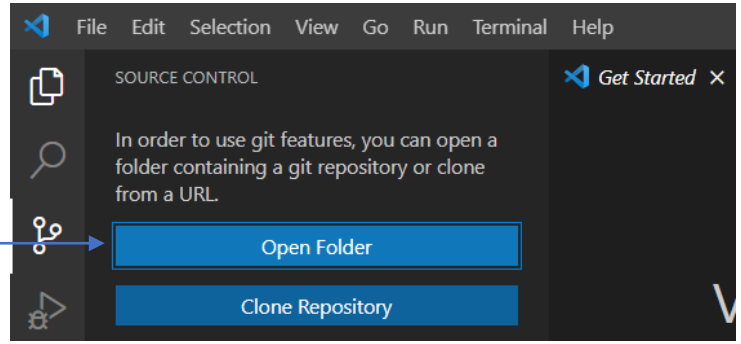


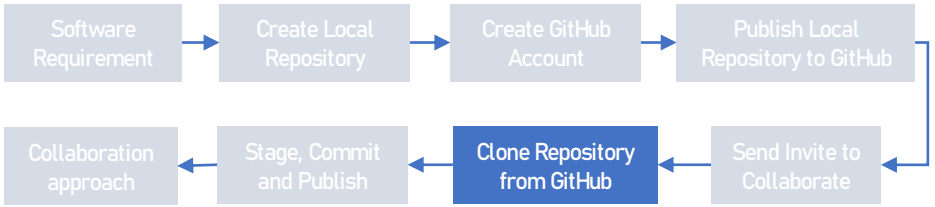
9. Click Select Repository Location to proceed with cloning.



10. To check if cloning was successful, mouse over the group of icons at the bottom left corner of VS Code editor – you should see a No Problems

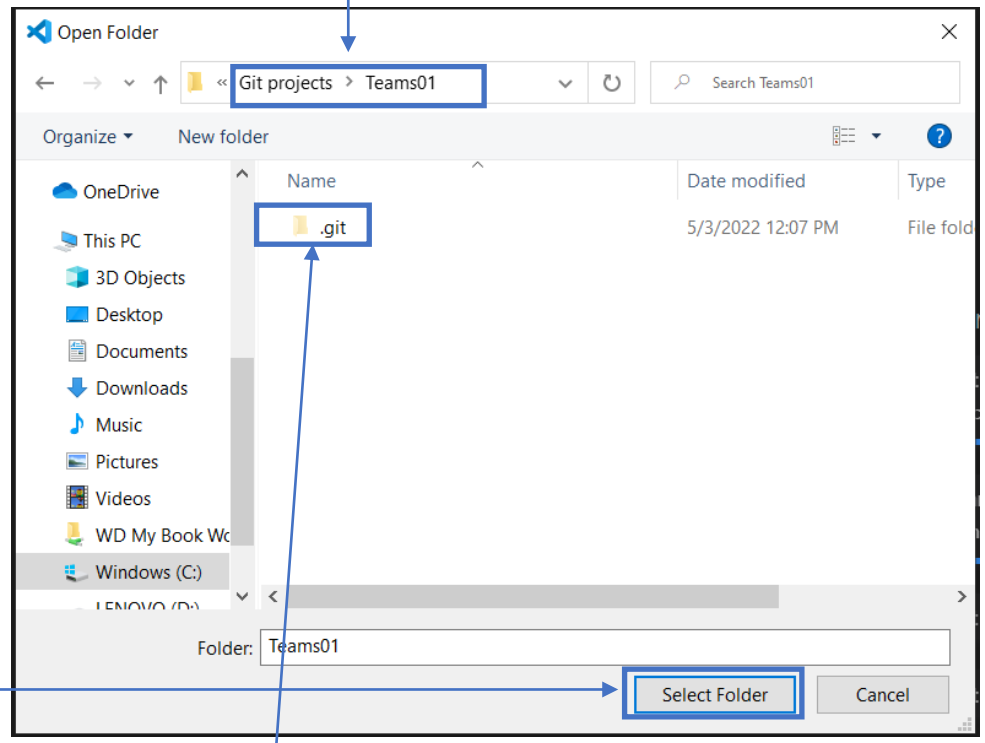
11. Click on Open Folder to access the cloned repository.





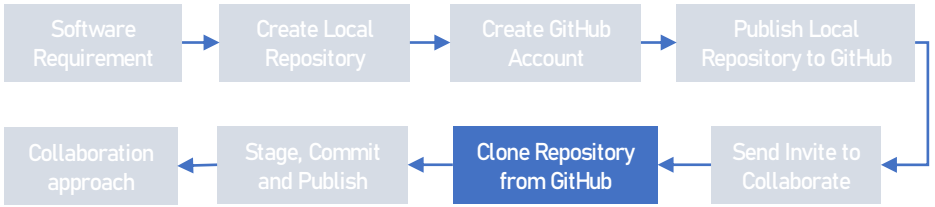
This is the folder created during the cloning of repository in our example.

12. Navigate to the folder that was created during cloning (in our example it was Teams01) which is located inside the repository location (in our example was Git projects) and click on Select Folder.



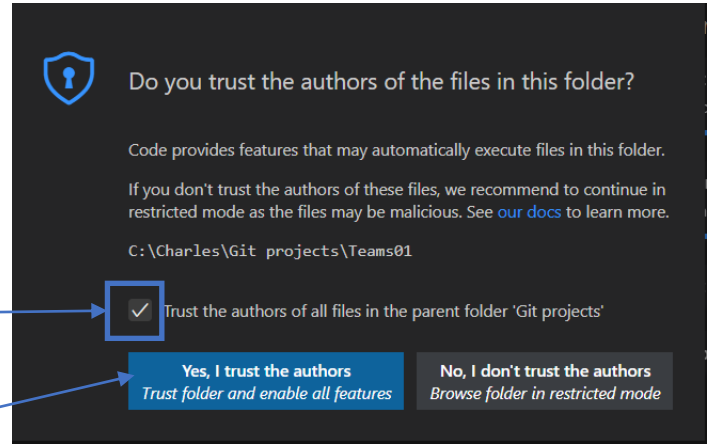
Select the folder where the repository was created

NOTE: The **.git** folder is a hidden folder. It shows that there is a Git repository in this folder. If you are unable to see it, checkout these instructions on how to view hidden files and folders in Windows.

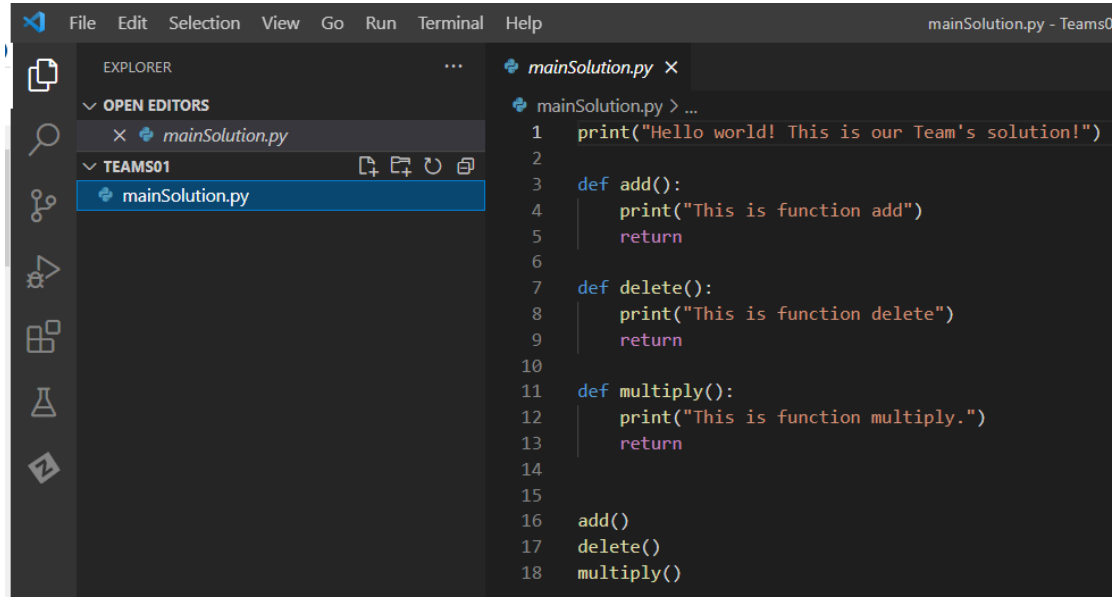


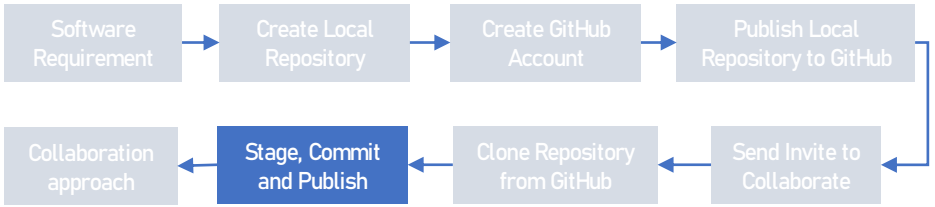
13. Tick on the checkbox Trust the authors of all files in the parent folder…

14. Click on Yes, I trust the authors to open the cloned repository.



Below is the resulting repository that was cloned.

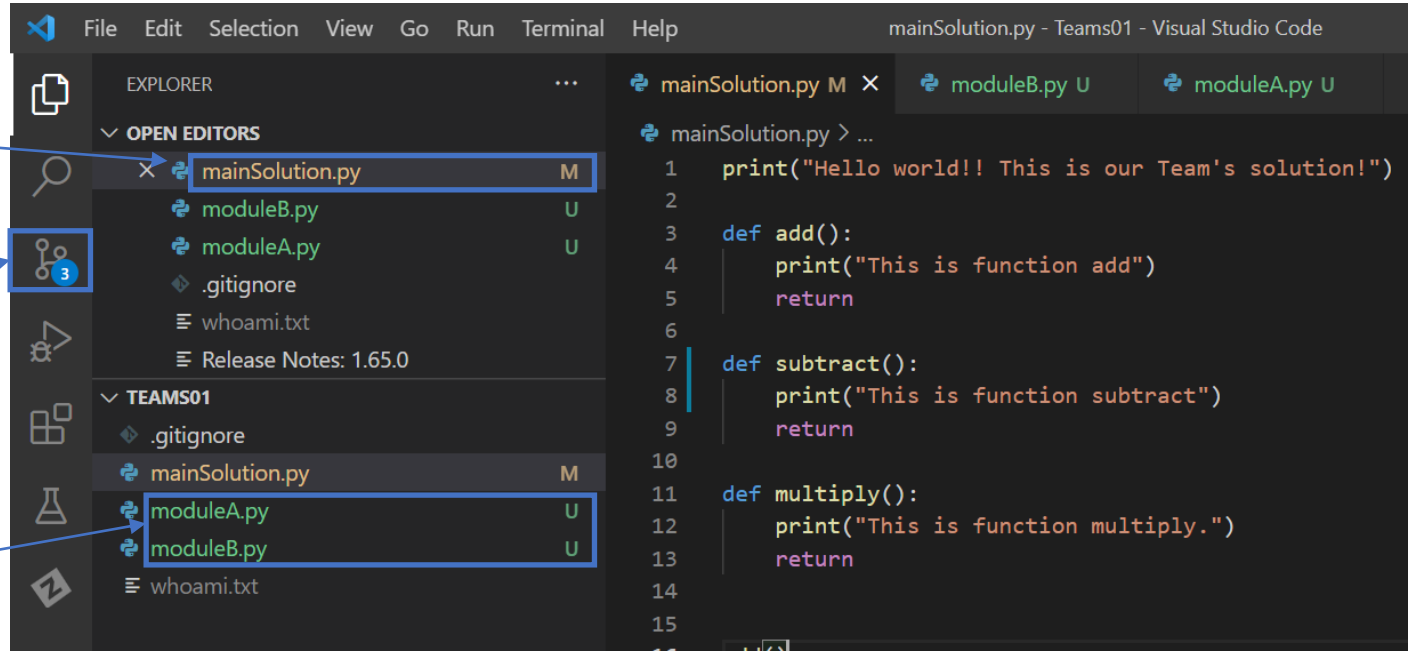


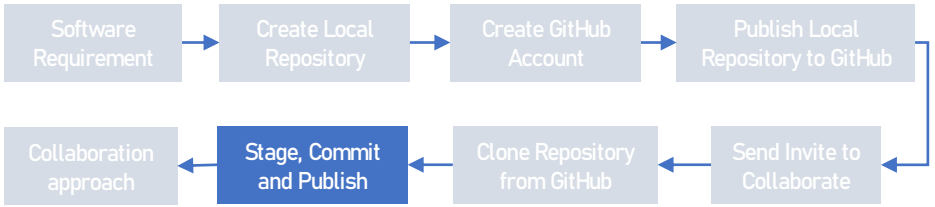


In this example, minor changes were made to the codes inside mainSolution.py.
The letter **M** on the right indicates that this file was **M**odified.

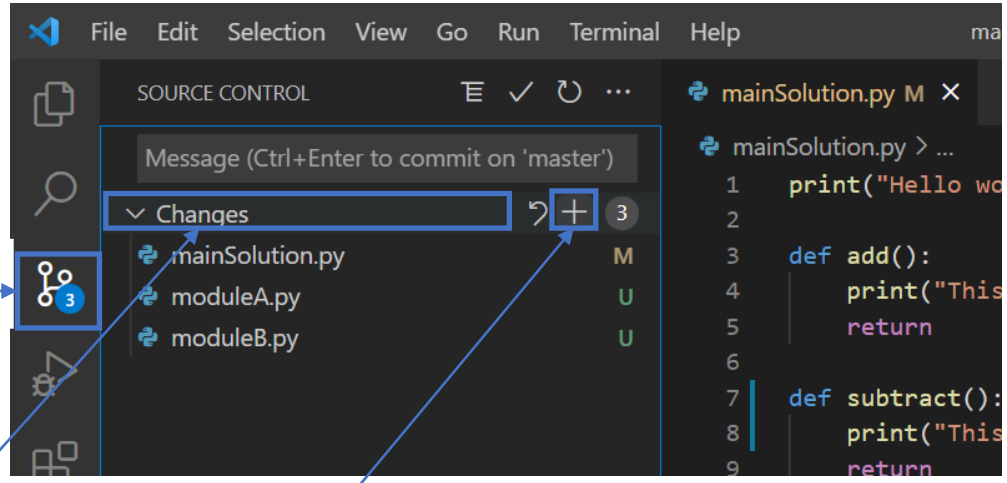
The number **3** indicates that there are 3 pending changes.

2 new files, moduleA.py and module.py were added to this depository.
The letter **U** on their right shows that the changes on these files are **U**ntracked by Git.



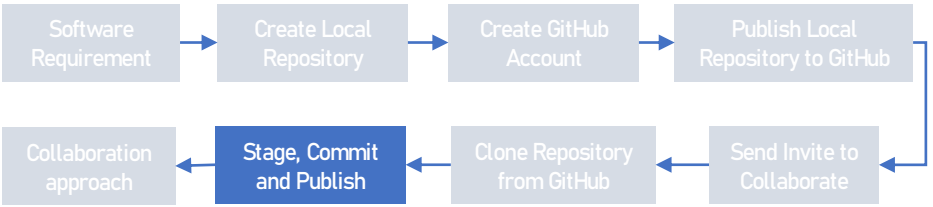


1. Select Source Control



2. Mouse over the expandable list Changes until you see the **+** sign and then click on it to Stage All Changes.

NOTE: When you mouse over each individual file, the + sign you see will only Stage Changes for that selected file.

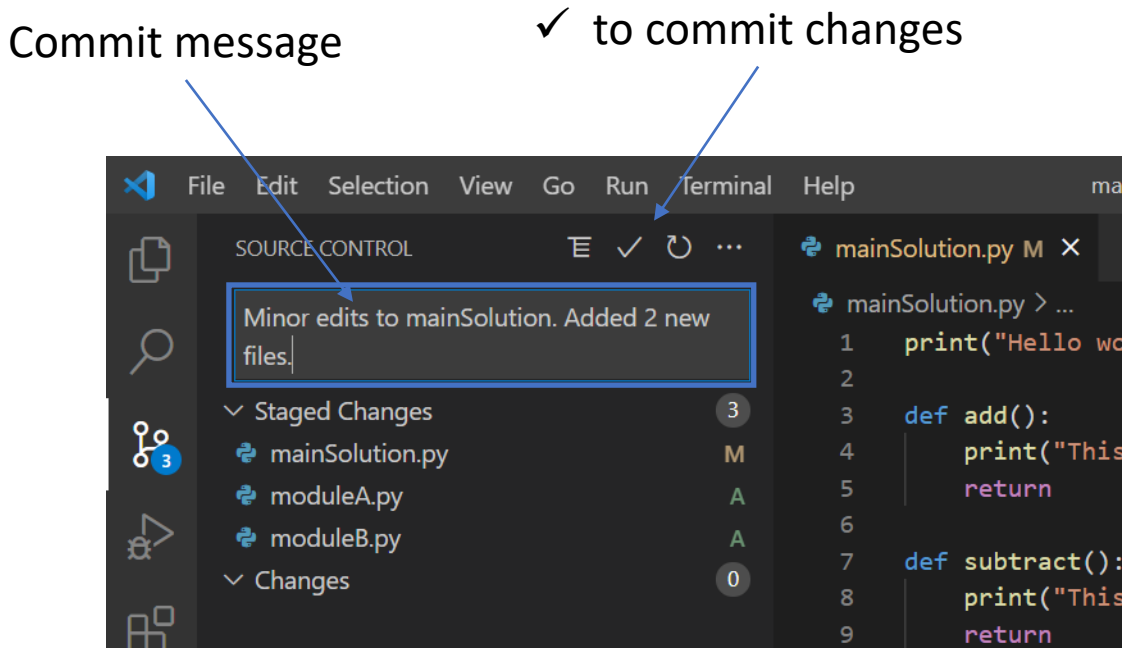


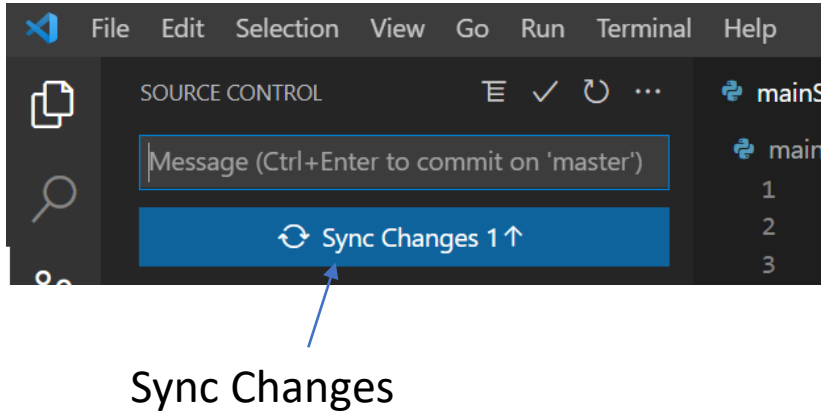
3. After you have Stage All Changes, enter a meaningful commit message describing the changes made for this commit.

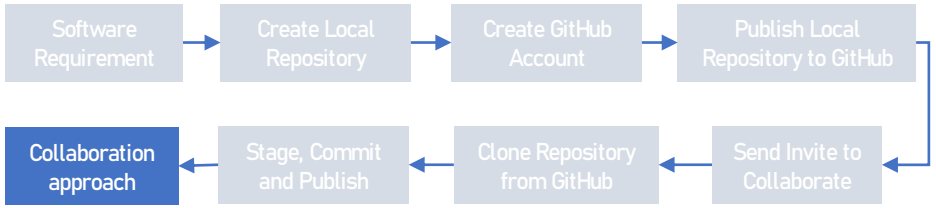
4. Once you are done, press CTRL+Enter to commit. Alternatively, you can click on the ✓ located above to commit the changes.

Optional reading: [Art of writing a good commit message]

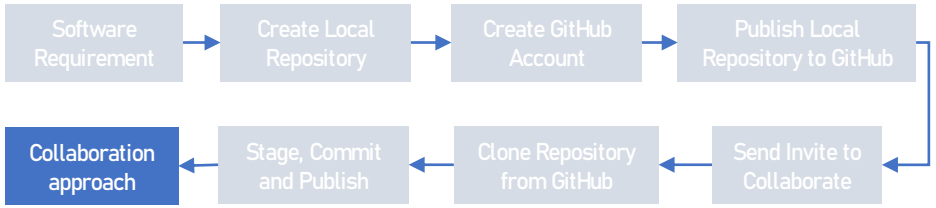
5. After committing the changes, the option to Sync Changes will be available to push/pull committed changes to/from remote repository. Click on Sync Changes to synchronize changes with the remote repository.



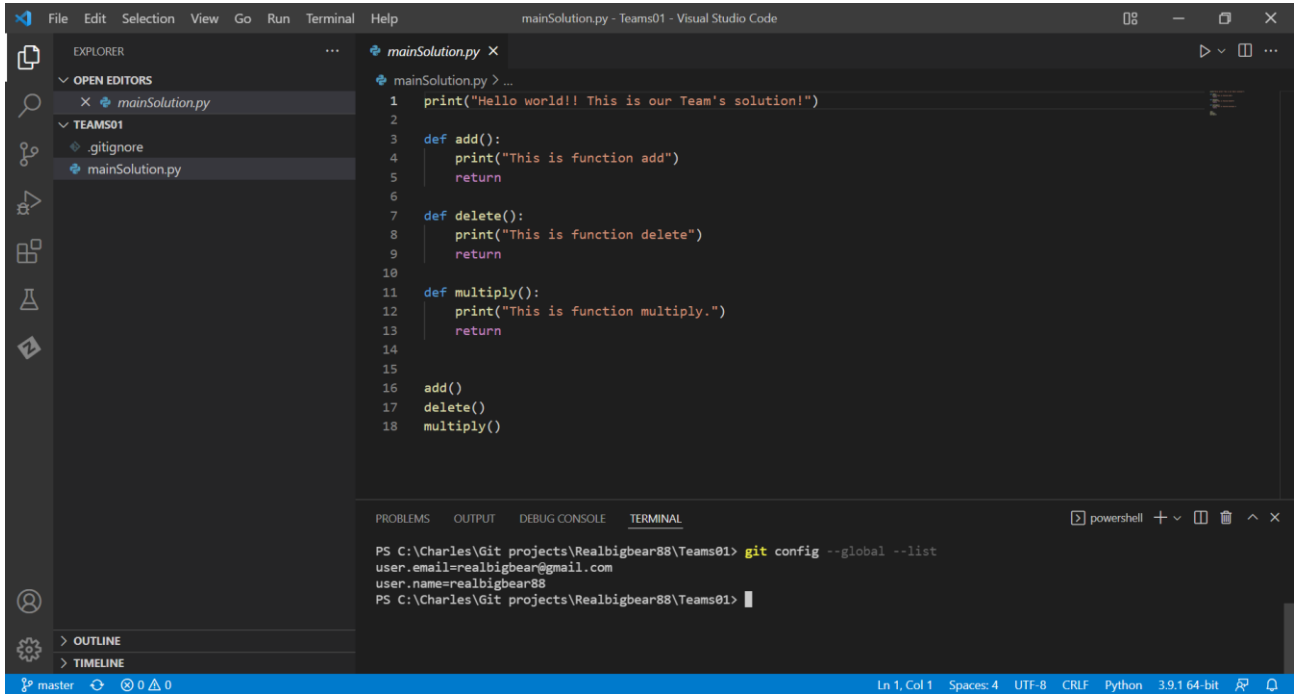


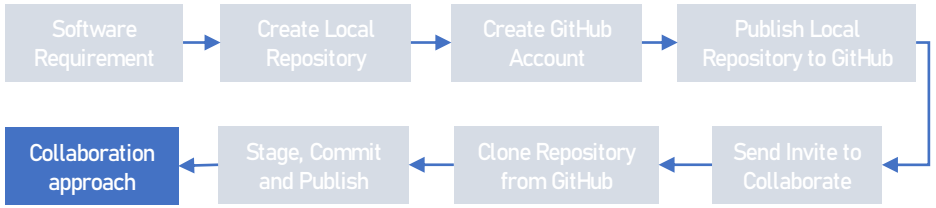


- Main solution consists of individual modules to be developed by members.
- One or more members will be responsible for designing the main flow of the solution, the functionalities and specifications of the required functions of each module. The same member(s) will be responsible for importing these modules into the main solution for implementation and testing.
- Other members will be responsible for implementing and testing specific functions in each of the modules they are responsible for. In summary, one member will work on one module with specific function(s) that do not overlap with other modules.
- Communication is key to collaboration. Changes, updates and bug fixes should be communicated among members.



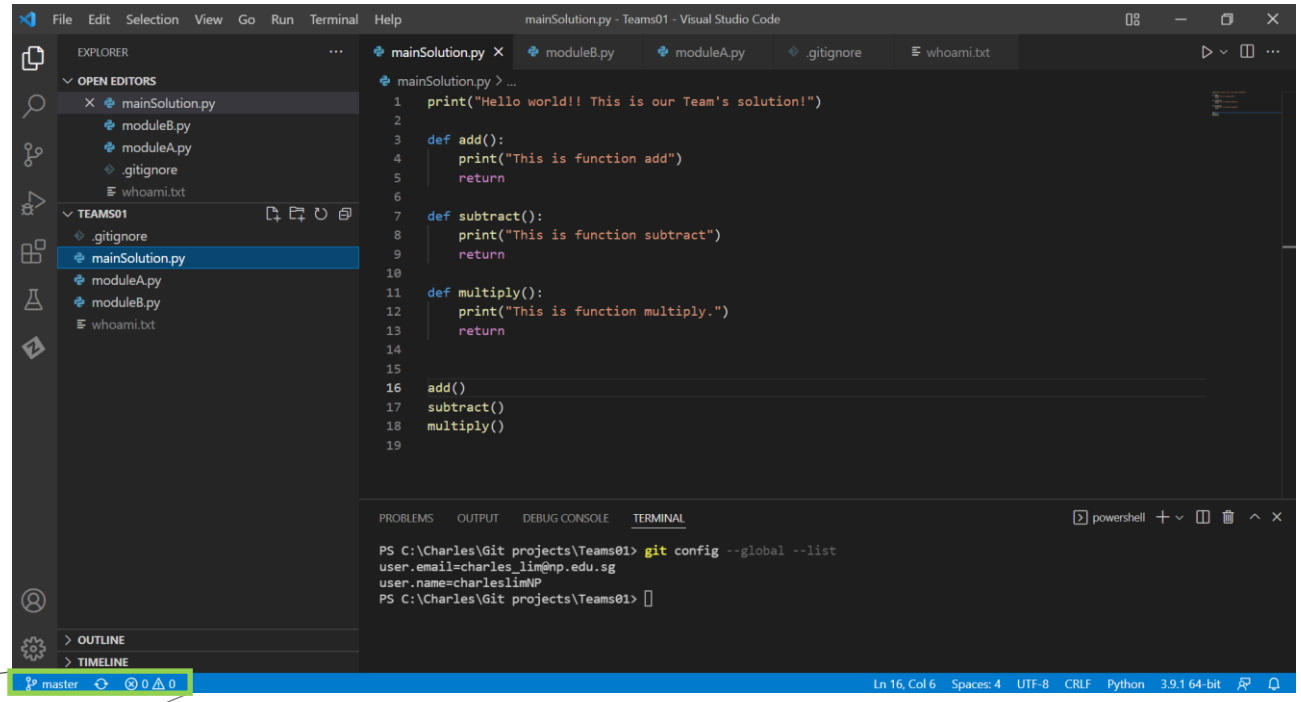
Upon joining the project team, a new project member will need to clone the remote repository which contains all the updated project files and folder, if any.

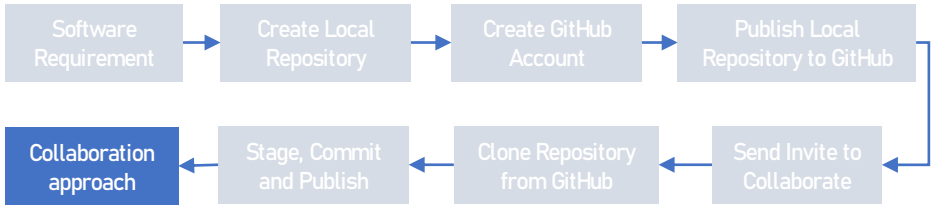




Another project team member working on a separate computer made changes to a file, added 2 files and then Sync Changes to remote repository.

Sync Changes will push/pull committed changes to/from remote repository.

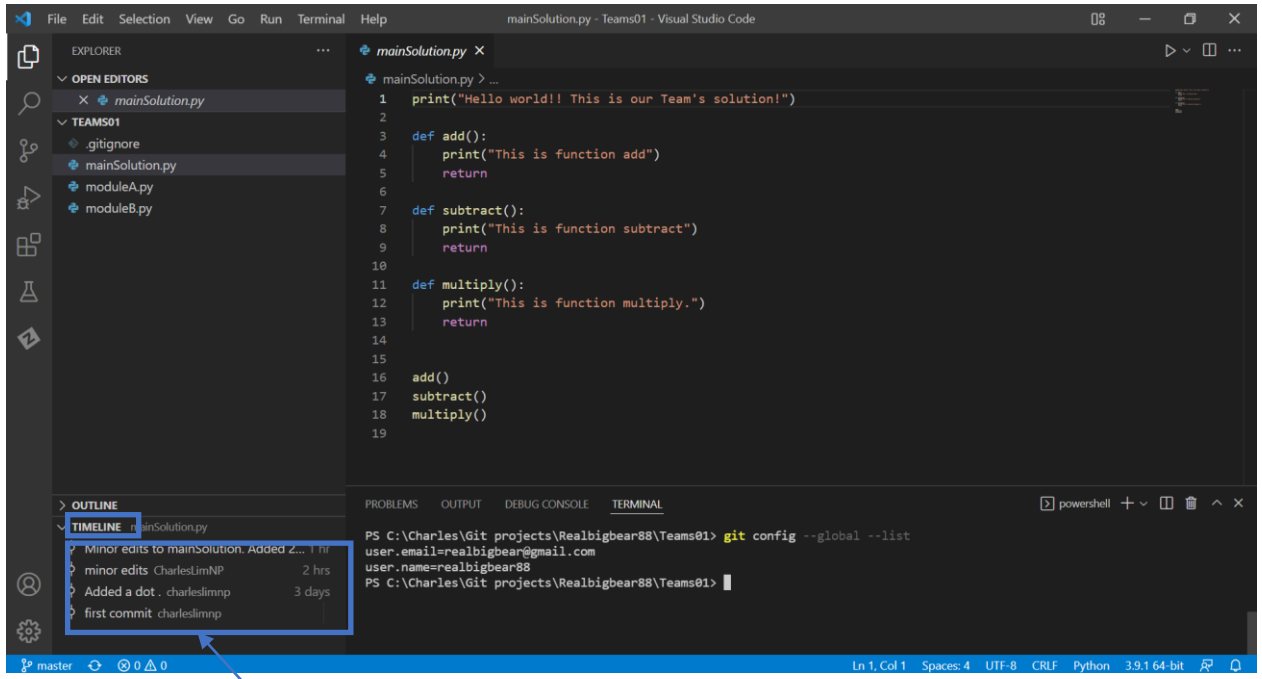




Every time before a member starts working on the project, he should **Sync Changes** as the first step. This is to ensure that changes made by other members will be updated in the local repository.

In this example, the changes committed that has been pushed to the repository by other team members will be downloaded to the local repository after Sync Changes.

In the same manner, this member should sync any changes to the remote repository for collaboration at the end of the day.



Note that the commits (items inside expandable list TIMELINE) made by other team members are also available with their commit messages and will be refreshed each time Sync Changes is performed.

Practice

Select a **team leader** to –

- Create a local folder with the following Python files:
  - A main solution file mainSolution.py that will be used to call functions from imported modules;
  - 4 empty module files: add.py, subtract.py, multiply.py and divide.py.
- Assign one of the module files to each team member for implementing the respective functions add, subtract, multiply and divide
- Initialise repo to GitHub with the folder
- Publish to GitHub
- Invite members to collaborate

Each **team members** to –

- Clone the repo from invitation
- Implement the function to the assigned file(s) in repo
  - For example, member 1 to write an add function to add.py

```
def add(x, y):
        return x +y
```

- Stage, commit and publish the changes

Expected output of mainSolution.py

```
Enter a number: 144
Enter another number: 12
Adding 144 to 12 yields 156
Multiplying 144 with 12 yields 1728
Subtracting 144 from 12 yields -132
Dividing 144 with 12 yields 12.0
```