

# Source Control

## ❖ Part 1: Working with your own Git repository.

### ➤ Create a GitHub account.

Create an SSH key pair and add it to GitHub.

Alternatively, create a personal access token.

#### A) Creating an SSH key.

```
Ivan@DESKTOP-B2JS5BQ MINGW64 ~
$ ssh-keygen -t rsa -b 4096 -C "ivanpupinoski03@gmail.com"
Generating public/private rsa key pair.
Enter file in which to save the key (/c/Users/Ivan/.ssh/id_rsa):
/c/Users/Ivan/.ssh/id_rsa already exists.
Overwrite (y/n)? y
Enter passphrase for "/c/Users/Ivan/.ssh/id_rsa" (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /c/Users/Ivan/.ssh/id_rsa
Your public key has been saved in /c/Users/Ivan/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:0ExnR5zECWYPZryQIXBlx80x75likXGAMM+NObyjFus ivanpupinoski03@gmail.com
The key's randomart image is:
+---[RSA 4096]-----+
|  ..o..+X*+=o. |
|  . oo*.X*+o*   |
|    ..+X + .   |
|  o +.. o o o   |
|    + S o o +   |
|      . + o .   |
|      +         |
|      o         |
|      E         |
+---[SHA256]-----+
```

#### B) Checking if the key has been created.

```
Ivan@DESKTOP-B2JS5BQ MINGW64 ~/.ssh
$ ls -al
total 36
drwxr-xr-x 1 Ivan 197121  0 Mar  3 02:23 ./
drwxr-xr-x 1 Ivan 197121  0 Mar  3 02:22 ../
-rw-r--r-- 1 Ivan 197121 3434 Mar  3 02:44 id_rsa
-rw-r--r-- 1 Ivan 197121  751 Mar  3 02:44 id_rsa.pub
```

- id\_rsa -> private key
- id\_rsa.pub -> public key

#### C) Starting the SSH agent and adding the key.

```
Ivan@DESKTOP-B2JS5BQ MINGW64 ~/.ssh
$ eval $(ssh-agent -s)
Agent pid 1960

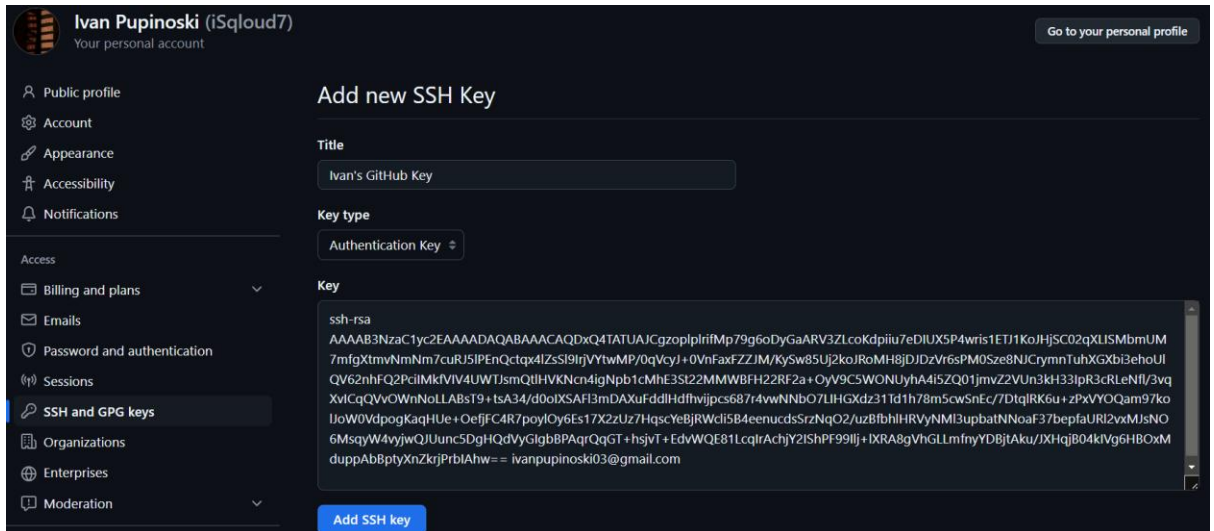
Ivan@DESKTOP-B2JS5BQ MINGW64 ~/.ssh
$ ssh-add ~/.ssh/id_rsa
Enter passphrase for /c/Users/Ivan/.ssh/id_rsa:
Identity added: /c/Users/Ivan/.ssh/id_rsa (ivanpupinoski03@gmail.com)
```

#### D) Copy the key.

```
Ivan@DESKTOP-B2JS5BQ MINGW64 ~/.ssh
$ cat ~/.ssh/id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQCDxQ4TATUAJGzoplp1riFmp79g6oDyGaARV3ZLcoKdp1iu7eDIUX5P4wris1E
TJ1koJHjSC02qXLISMbmUM7mfgXtmvNmNm7cuRJ51PEnQctqx41ZsS19IrjVYtwMP/0qVcyJ+0VnFaxFZZJM/KySw85Uj2koJRo
MH8jDDzVr6sPM0Sze8NJcrymTuhXGxbi3ehou1QV62nhFQ2PciIMkfVIV4UWTJsmQt1HVKNcn4igNpb1cMhE3St22MMWBFH22
RF2a+oyv9C5wONUYhA4i5ZQ01jmvZ2VUn3kH33IpR3cRLenFl/3vqXvICqQVvOWnNoLLABsT9+tsA34/d0oIXSAF13mDAXuFdd1
Hdfhvi jpcs687r4vwnNB07LIHGxdz31Td1h78m5cwSnEc/7Dtq1RK6u+zPxVYOQam97ko1Jow0VdpogKaqHue+OefjFC4R7poy1
Oy6Es17X2zUz7HqscYeBjRwcli5B4eenucdsSrZNq02/uzBfbh1HRVynMl3upbatNNoaF37bepfaUR12vxMJ sNO6Msqyw4vyjwQ
JUunc5DgHQdVyGigBPAqrQqGT+hsjvT+EdvQE81LcQrIAchjY2IshPF99I1j+1XRA8gvhGLLmfnyYDBjtAku/JXHqjB04kIVg
6HBOXMduppAbBptyXnZkrjPrbIAhw== ivanpupinoski03@gmail.com
```

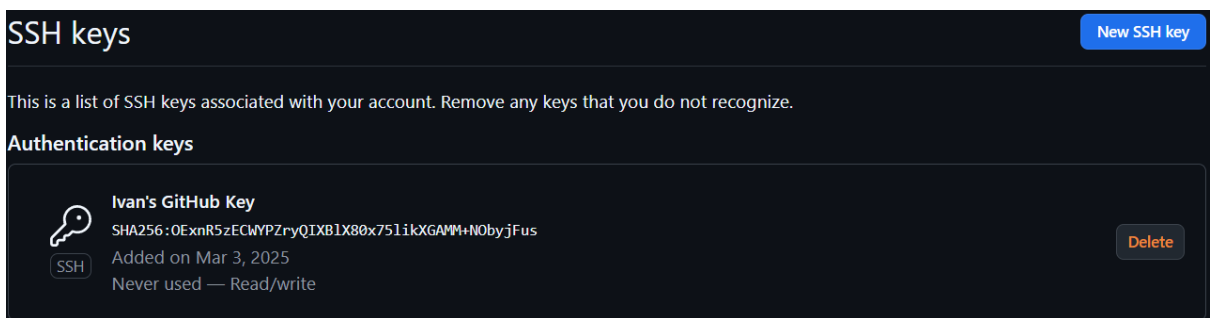
## E) Adding a key to Git.

Log in to GitHub -> Settings -> SSH and GPG keys -> New SSH key



The screenshot shows the GitHub 'Add new SSH Key' form. On the left is a sidebar with navigation links: Public profile, Account, Appearance, Accessibility, Notifications, Access, Billing and plans, Emails, Password and authentication, Sessions, SSH and GPG keys (highlighted), Organizations, Enterprises, and Moderation. The main form has three sections: 'Title' with a text input containing 'Ivan's GitHub Key'; 'Key type' with a dropdown menu set to 'Authentication Key'; and 'Key' with a large text area containing an SSH key and the email 'ivanpupinoski03@gmail.com'. A blue 'Add SSH key' button is at the bottom right.

Then click -> Add SSH key.



The screenshot shows the GitHub 'SSH keys' page. At the top right is a 'New SSH key' button. Below the header, it says 'This is a list of SSH keys associated with your account. Remove any keys that you do not recognize.' Under the 'Authentication keys' section, there is one key listed: 'Ivan's GitHub Key' with a key icon, SHA256 fingerprint, date added (Mar 3, 2025), and status (Never used — Read/write). A 'Delete' button is to the right of the key entry.

## E) Testing the SSH connection.

Successfully added the key.

```
Ivan@DESKTOP-B2JS5BQ MINGW64 ~/.ssh
$ ssh -T git@github.com
The authenticity of host 'github.com (140.82.121.3)' can't be established.
ED25519 key fingerprint is SHA256:+DiY3wvvV6TuJJhbpZisF/zLDA0zPMSvHdkr4UvCOqU.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'github.com' (ED25519) to the list of known hosts.
Hi iSqloud7! You've successfully authenticated, but GitHub does not provide shell access.
```

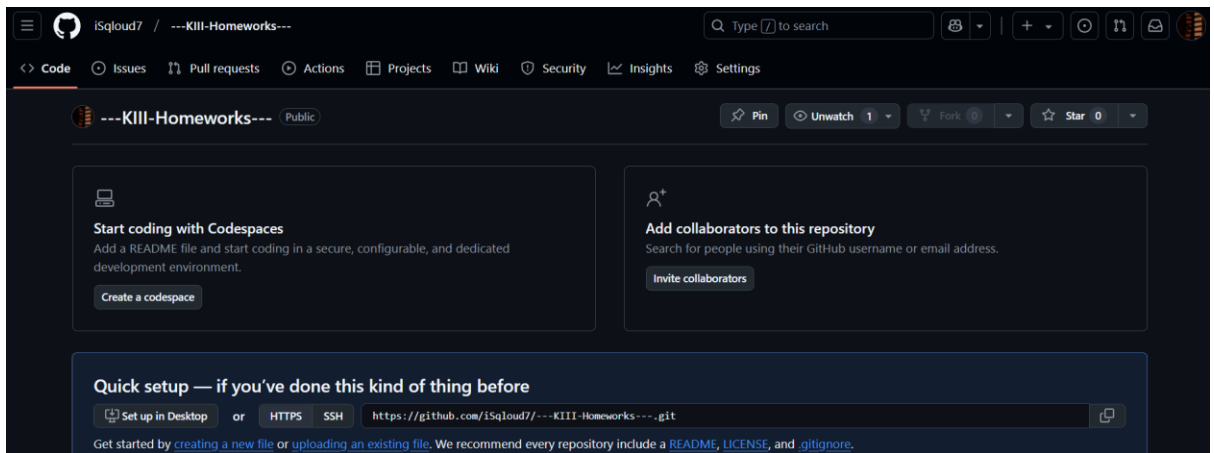
## ➤ Create a new GitHub repository and clone it locally.

### A) Creating GitHub repository.

First, go to **Repositories** section, then click on the **New button**.

Then there is an option to add Repository name (---KIII-Homeworks---) and Description, also a choice for what the repository should be, whether public or private.

Finally, click **Create repository**.



Then the SSH link is copied, which will further serve for local cloning of the repository.

### B) Local cloning.

To perform a local clone, first open Git Bash, then navigate to the path where we want the local repository to be.

```
Ivan@DESKTOP-B2JS5BQ MINGW64 ~  
$ cd Desktop  
  
Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop  
$ git clone https://github.com/iSqloud7/---KIII-Homeworks---.git  
Cloning into '---KIII-Homeworks---'...  
warning: You appear to have cloned an empty repository.
```

Then with the command `git clone https://github.com/iSqloud7/---KIII-Homeworks---.git`, the repository was successfully cloned locally.

- **Work locally to add new content, stage the files, make a commit, and push the changes to GitHub.**

### A) Work locally in Git Bash.

First we go into our working directory, and start running commands.

```
Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop  
$ cd /c/Users/Ivan/Desktop/---KIII-Homeworks---  
  
Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (master)  
$ nano file.txt  
  
Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (master)  
$ git status  
On branch master  
  
No commits yet  
  
Untracked files:  
  (use "git add <file>..." to include in what will be committed)  
    file.txt  
  
nothing added to commit but untracked files present (use "git add" to track)
```

```
$ git add file.txt
warning: in the working copy of 'file.txt', LF will be replaced by CRLF the next time Git touches it

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (master)
$ git status
On branch master

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
        new file:   file.txt
```

```
$ nano my-subject-info.txt

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (master)
$ git status
On branch master

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
        new file:   file.txt

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        my-subject-info.txt
```

```
$ git add my-subject-info.txt
warning: in the working copy of 'my-subject-info.txt', LF will be replaced by CRLF the next time Git touches it

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (master)
$ nano file.txt

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (master)
$ git status
On branch master

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
        new file:   file.txt
        new file:   my-subject-info.txt

Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified:   file.txt
```

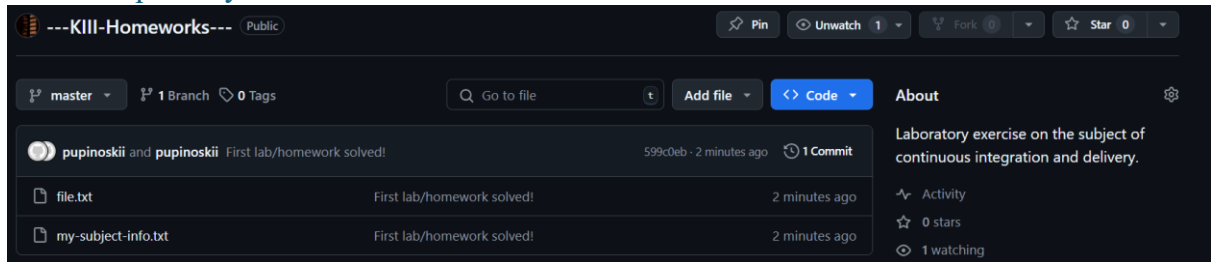
```
$ git commit -m "First lab/homework solved!"
[master (root-commit) 599c0eb] First lab/homework solved!
2 files changed, 2 insertions(+)
create mode 100644 file.txt
create mode 100644 my-subject-info.txt
```

```
$ git log
commit 599c0eb1414ad59edf302a6fa63e9da86338ade2 (HEAD -> master)
Author: pupinoskii <Ivan Pupinoski>
Date:   Mon Mar 3 03:48:11 2025 +0100

    First lab/homework solved!

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (master)
$ git push origin master
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 8 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (4/4), 331 bytes | 331.00 KiB/s, done.
Total 4 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/iSqloud7/---KIII-Homeworks---.git
 * [new branch]      master -> master
```

B) GitHub repository after the executed commands.



➤ Create develop, test and production branches.

```
Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (master)
$ git checkout -b develop
Switched to a new branch 'develop'

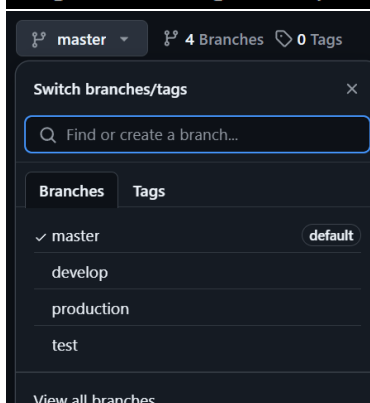
Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (develop)
$ git push origin develop
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
remote:
remote: Create a pull request for 'develop' on GitHub by visiting:
remote:   https://github.com/iSqloud7/---KIII-Homeworks---/pull/new/develop
remote:
To https://github.com/iSqloud7/---KIII-Homeworks---.git
 * [new branch]      develop -> develop

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (develop)
$ git checkout -b test
Switched to a new branch 'test'

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (test)
$ git push origin test
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
remote:
remote: Create a pull request for 'test' on GitHub by visiting:
remote:   https://github.com/iSqloud7/---KIII-Homeworks---/pull/new/test
remote:
To https://github.com/iSqloud7/---KIII-Homeworks---.git
 * [new branch]      test -> test

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (test)
$ git checkout -b production
Switched to a new branch 'production'

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (production)
$ git push origin production
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
remote:
remote: Create a pull request for 'production' on GitHub by visiting:
remote:   https://github.com/iSqloud7/---KIII-Homeworks---/pull/new/production
remote:
To https://github.com/iSqloud7/---KIII-Homeworks---.git
 * [new branch]      production -> production
```



- **Make several changes and commit to the develop branch, then merge it into the other two branches. Push the changes to GitHub.**

**A) Changes in the develop branch.**

```
Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (master)
$ git checkout develop
M      file.txt
Switched to branch 'develop'

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (develop)
$ nano file-A.txt

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (develop)
$ git add file-A.txt
warning: in the working copy of 'file-A.txt', LF will be replaced by CRLF the next time Git touches it

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (develop)
$ git commit -m "Adding new file in the develop branch"
[develop c1073d6] Adding new file in the develop branch
 1 file changed, 1 insertion(+)
 create mode 100644 file-A.txt

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (develop)
$ git push origin develop
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 8 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 335 bytes | 335.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/isqloud7/---KIII-Homeworks---.git
 599c0eb..c1073d6  develop -> develop
```

develop 4 Branches 0 Tags

Go to file Add file Code

This branch is 1 commit ahead of master.

Contribute

pupinoskii and pupinoskii Adding new file in the develop branch c1073d6 · 2 minutes ago 2 Commits

file-A.txt	Adding new file in the develop branch	2 minutes ago
file.txt	First lab/homework solved!	15 minutes ago
my-subject-info.txt	First lab/homework solved!	15 minutes ago

**B) Merging with the two other branches.**

```
Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (develop)
$ git checkout test
M      file.txt
Switched to branch 'test'

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (test)
$ git merge develop
Updating 599c0eb..c1073d6
Fast-forward
 file-A.txt | 1 +
 1 file changed, 1 insertion(+)
 create mode 100644 file-A.txt

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (test)
$ git push origin test
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/isqloud7/---KIII-Homeworks---.git
 599c0eb..c1073d6  test -> test

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (test)
$ git checkout production
M      file.txt
Switched to branch 'production'

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (production)
$ git merge develop
Updating 599c0eb..c1073d6
Fast-forward
 file-A.txt | 1 +
 1 file changed, 1 insertion(+)
 create mode 100644 file-A.txt

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (production)
$ git push origin production
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/isqloud7/---KIII-Homeworks---.git
 599c0eb..c1073d6  production -> production
```



test 4 Branches 0 Tags

Go to file Add file Code

This branch is 1 commit ahead of master.

Contribute

pupinoskii and pupinoskii Adding new file in the develop branch c1073d6 · 4 minutes ago 2 Commits

file-A.txt	Adding new file in the develop branch	4 minutes ago
file.txt	First lab/homework solved!	17 minutes ago
my-subject-info.txt	First lab/homework solved!	17 minutes ago

production 4 Branches 0 Tags

Go to file Add file Code

This branch is 1 commit ahead of master.

Contribute

pupinoskii and pupinoskii Adding new file in the develop branch c1073d6 · 4 minutes ago 2 Commits

file-A.txt	Adding new file in the develop branch	4 minutes ago
file.txt	First lab/homework solved!	18 minutes ago
my-subject-info.txt	First lab/homework solved!	18 minutes ago

- When you're done with the branch, merge it to main. Then, commit and push to GitHub.

```
Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (master)
$ git checkout master
M      file.txt
Already on 'master'
Your branch is up to date with 'origin/master'.

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (master)
$ git merge develop
Updating 599c0eb..c1073d6
Fast-forward
 file-A.txt | 1 +
 1 file changed, 1 insertion(+)
 create mode 100644 file-A.txt

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (master)
$ git push origin master
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/iSqloud7/---KIII-Homeworks---.git
 599c0eb..c1073d6  master -> master
```

master 4 Branches 0 Tags

Go to file Add file Code

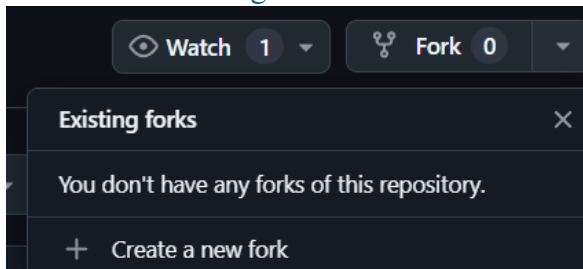
pupinoskii and pupinoskii Adding new file in the develop branch c1073d6 · 7 minutes ago 2 Commits

file-A.txt	Adding new file in the develop branch	7 minutes ago
file.txt	First lab/homework solved!	21 minutes ago
my-subject-info.txt	First lab/homework solved!	21 minutes ago

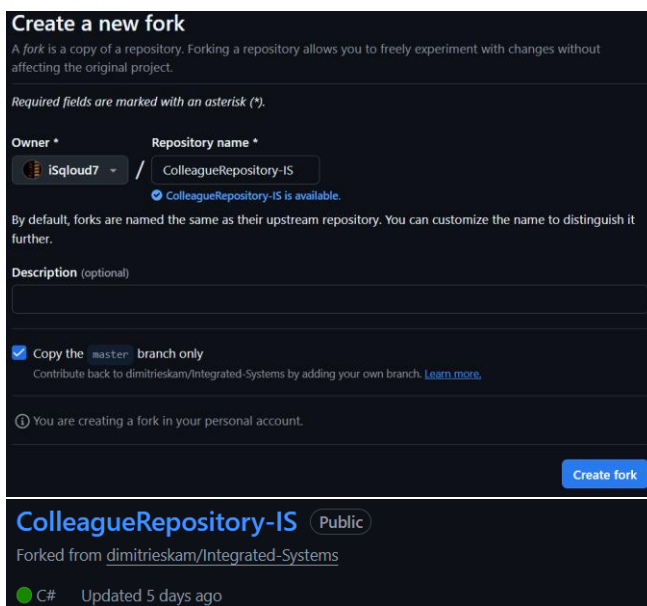
## ❖ Part 2: Contributing to another Git repository on GitHub.

### ➤ Fork a colleague's GitHub repository.

A) The first thing we need to do is go to the repository we want to fork, which is from our colleague and click on **Create new fork**.



B) We can give it another name in the Repository name field, as well as a description, and finally press **Create fork**.



**Create a new fork**

A fork is a copy of a repository. Forking a repository allows you to freely experiment with changes without affecting the original project.

Required fields are marked with an asterisk (\*).

Owner \* Repository name \*

isqloud7 / ColleagueRepository-IS

ColleagueRepository-IS is available.

By default, forks are named the same as their upstream repository. You can customize the name to distinguish it further.

Description (optional)

☒ Copy the master branch only

Contribute back to dimitrieskam/Integrated-Systems by adding your own branch. [Learn more.](#)

☐ You are creating a fork in your personal account.

Create fork

**ColleagueRepository-IS** Public

Forked from dimitrieskam/Integrated-Systems

C# Updated 5 days ago

### ➤ Create a new branch for a new feature.

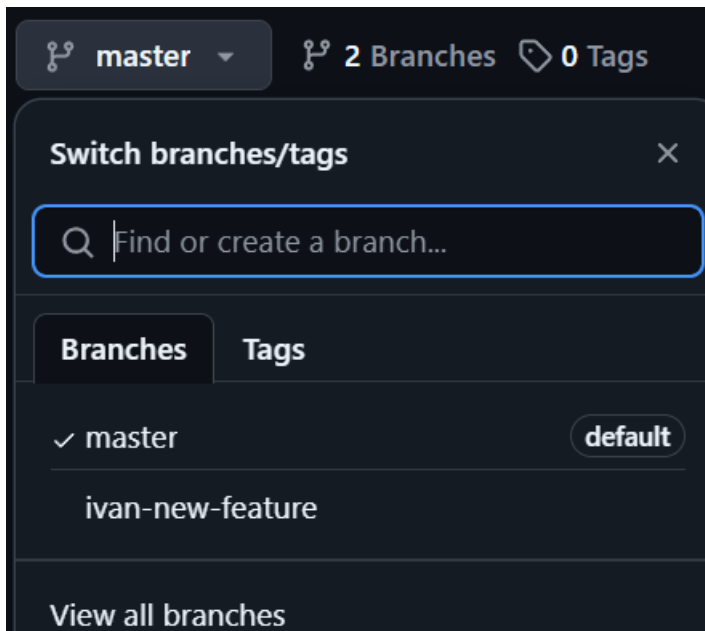
```
Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (master)
$ git clone "https://github.com/isqloud7/ColleagueRepository-IS.git"
Cloning into 'ColleagueRepository-IS'...
remote: Enumerating objects: 1763, done.
remote: Counting objects: 100% (203/203), done.
remote: Compressing objects: 100% (69/69), done.
remote: Total 1763 (delta 151), reused 134 (delta 134), pack-reused 1560 (from 1)
Receiving objects: 100% (1763/1763), 94.98 MiB | 2.27 MiB/s, done.
Resolving deltas: 100% (644/644), done.
Updating files: 100% (2958/2958), done.

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (master)
$ ls
ColleagueRepository-IS/ file-A.txt file.txt my-subject-info.txt
Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks--- (master)
$ cd ColleagueRepository-IS/

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks---/ColleagueRepository-IS (master)
$ git checkout -b ivan-new-feature
Switched to a new branch 'ivan-new-feature'

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks---/ColleagueRepository-IS (ivan-new-feature)
$ git push origin ivan-new-feature
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
remote:
remote: Create a pull request for 'ivan-new-feature' on GitHub by visiting:
remote:   https://github.com/isqloud7/ColleagueRepository-IS/pull/new/ivan-new-feature
remote:
To https://github.com/isqloud7/ColleagueRepository-IS.git
 * [new branch]      ivan-new-feature -> ivan-new-feature
```





➤ **Make changes, commit and push the changes to your GitHub repo.**

```
Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks---/ColleagueRepository-IS (ivan-new-feature)
$ nano README.md

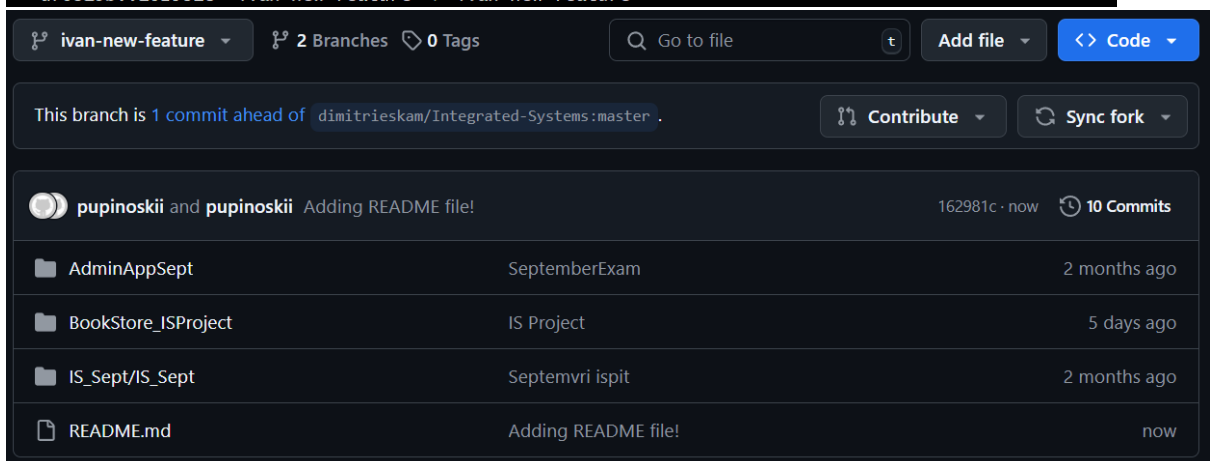
Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks---/ColleagueRepository-IS (ivan-new-feature)
$ git status
On branch ivan-new-feature
Untracked files:
  (use "git add <file>..." to include in what will be committed)
    README.md

nothing added to commit but untracked files present (use "git add" to track)

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks---/ColleagueRepository-IS (ivan-new-feature)
$ git add README.md
warning: in the working copy of 'README.md', LF will be replaced by CRLF the next time Git touches it

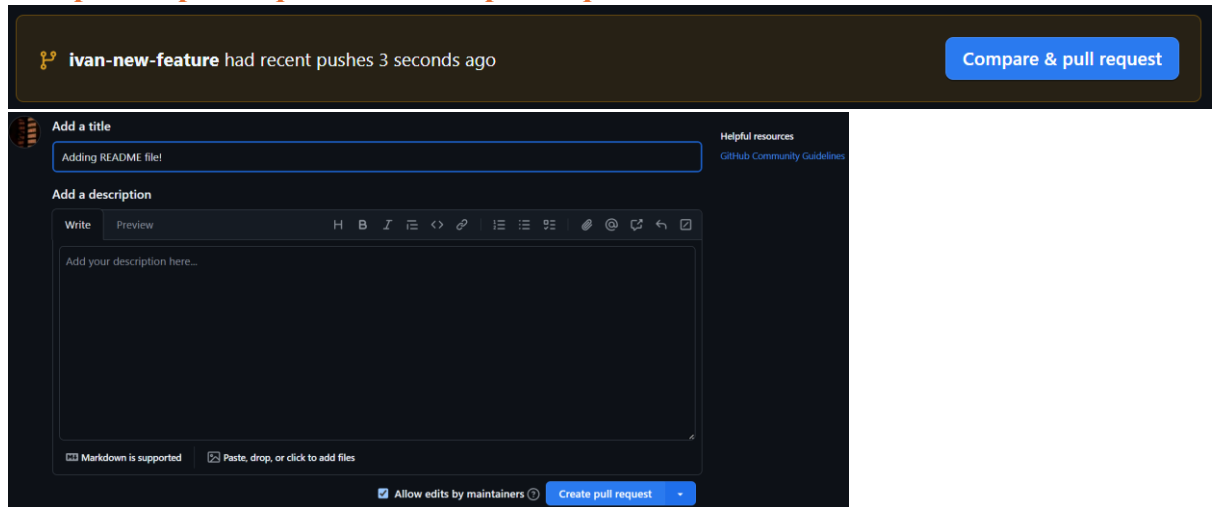
Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks---/ColleagueRepository-IS (ivan-new-feature)
$ git commit -m "Adding README file!"
[ivan-new-feature 162981c] Adding README file!
1 file changed, 1 insertion(+)
create mode 100644 README.md

Ivan@DESKTOP-B2JS5BQ MINGW64 ~/Desktop/---KIII-Homeworks---/ColleagueRepository-IS (ivan-new-feature)
$ git push origin ivan-new-feature
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 8 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 314 bytes | 314.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/isqloud7/ColleagueRepository-IS.git
df6819b..162981c ivan-new-feature -> ivan-new-feature
```



- When you're done, make a Pull Request with the new feature, via GitHub's website.

Compare & pull request -> Create pull request



The screenshot shows the GitHub 'Compare & pull request' interface. At the top, a dark blue banner indicates that 'ivan-new-feature' has recent pushes 3 seconds ago, with a 'Compare & pull request' button on the right. Below this, the 'Add a title' section contains a text input field with the placeholder 'Adding README file!'. The 'Add a description' section features a rich text editor with a 'Write' tab selected, a toolbar with formatting options (H, B, I, code, link, list, table, image, video, embed), and a large text area with the placeholder 'Add your description here...'. At the bottom of the description area, there are checkboxes for 'Markdown is supported' and 'Paste, drop, or click to add files'. A 'Create pull request' button is located at the bottom right, preceded by a checkbox for 'Allow edits by maintainers'.

- Ask your colleague to merge the Pull Request and close the issue.