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:OExnR5zECWYPZryQIXBlX80x75likXGAMM+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)
```
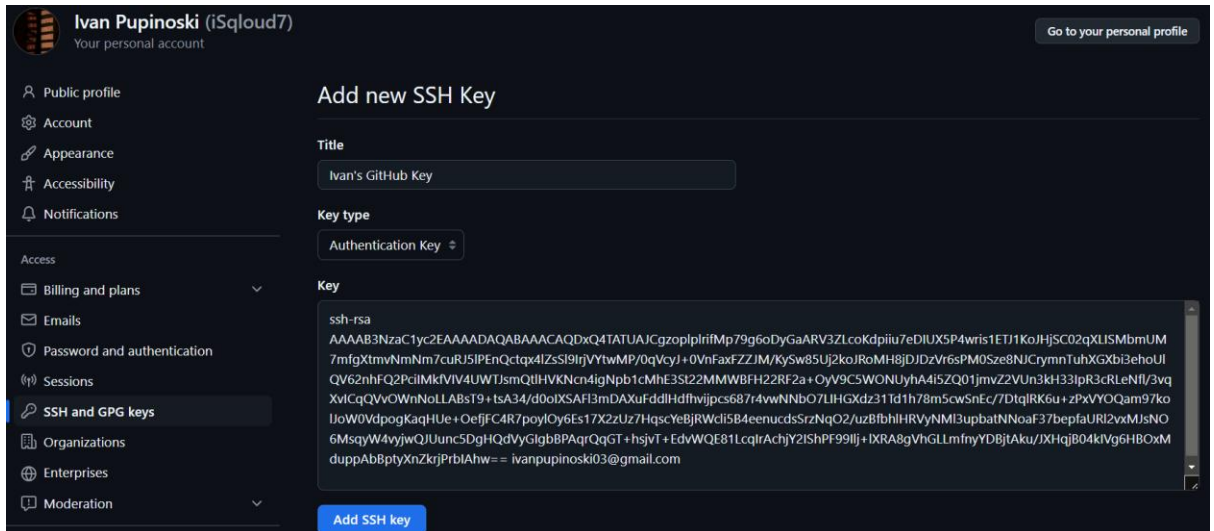
    D) Copy the key.

```
Ivan@DESKTOP-B2JS5BQ MINGW64 ~/.ssh
$ cat ~/.ssh/id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAACAQDxQ4TATUAJCgzoplplrifMp79g6oDyGaARV3ZLcoKdpiiu7eDIUX5P4wris1E
TJ1KoJHjSCO2qXLISMbmUM7mfgXtmvNmNm7cuRJ5lPEnQctqx4lZsSl9IrjVYtwMP/OqVcyJ+OVnFaxFZZJM/KySw85Uj2koJRo
MH8jDJDzVr6sPMOSze8NJCrymnTuhXGXbi3ehoUlQV62nhFQ2PciIMkfVIV4UWTJsmQtlHVKNcn4igNpb1cMhE3St22MMWBFH22
RF2a+OyV9C5WONUyhA4i5ZQ01jmvZ2VUn3kH33IpR3cRLeNfl/3vqXvICqQVvOWnNoLLABsT9+tsA34/dOoIXSAFl3mDAXuFddl
Hdfhvijpcs687r4vwNNbO7LIHGXdz31Td1h78m5cwSnEc/7DtqlRK6u+zPxVYOQam97kolJowOVdpogKaqHUe+OefjFC4R7poyl
Oy6Es17X2zUz7HqscYeBjRWcli5B4eenucdsSrzNqO2/uzBfbhlHRVyNMl3upbatNNoaF37bepfaURl2vxMJsNO6MsqyW4vyjwQ
JUunc5DgHQdVyGIgbBPAqrQqGT+hsjvT+EdvWQE8lLcqIrAchjY2IShPF99Ilj+lXRA8gVhGLLmfnyYDBjtAku/JXHqjBO4kIVg
6HBOxMduppAbBptyXnZkrjPrbIAhw== ivanpupinoski03@gmail.com
```
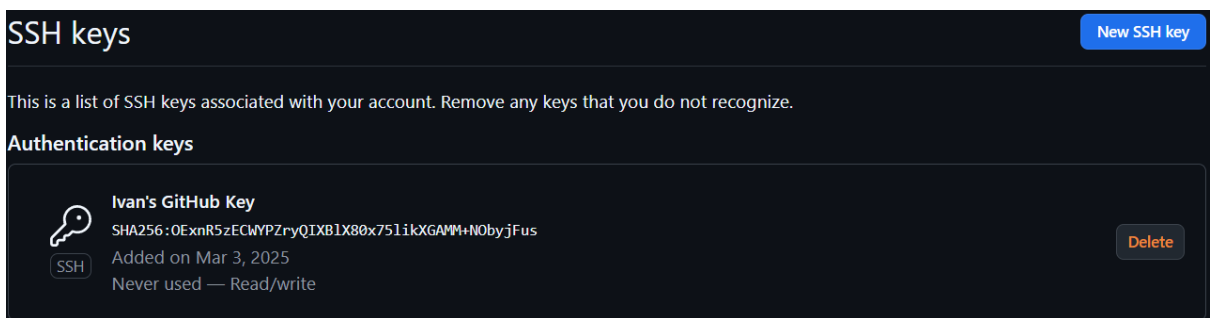
E) Adding a key to Git.

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

Then click -> Add SSH key.

E) Testing the SSH connection.
   Successfully added the key.

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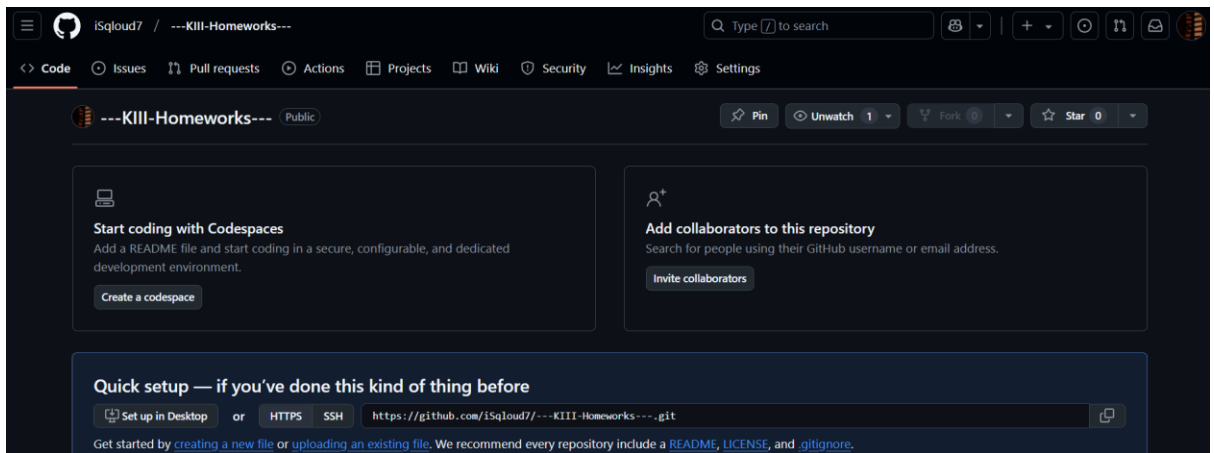
Then the SSH link is copied, which will further serve for local cloning of the repository.

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 out 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.
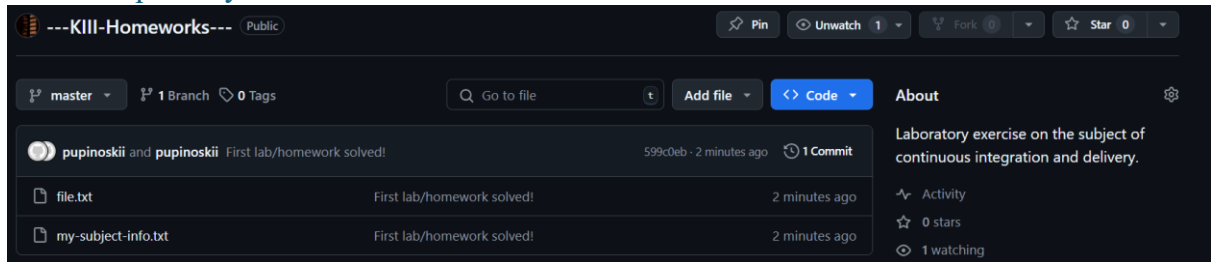
➤ **Create develop, test and production branches.**

➤ **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
```
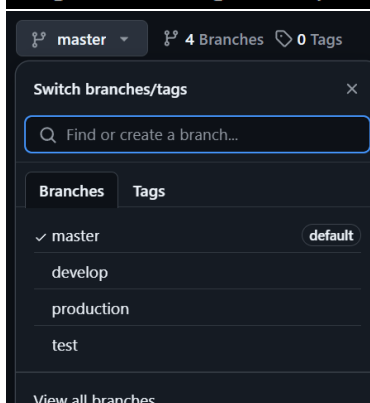
| ⑂ develop ▾ | ⑂ 4 Branches ◇ 0 Tags | 🔍 Go to file | t | Add file ▾ | <> Code ▾ |

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
```

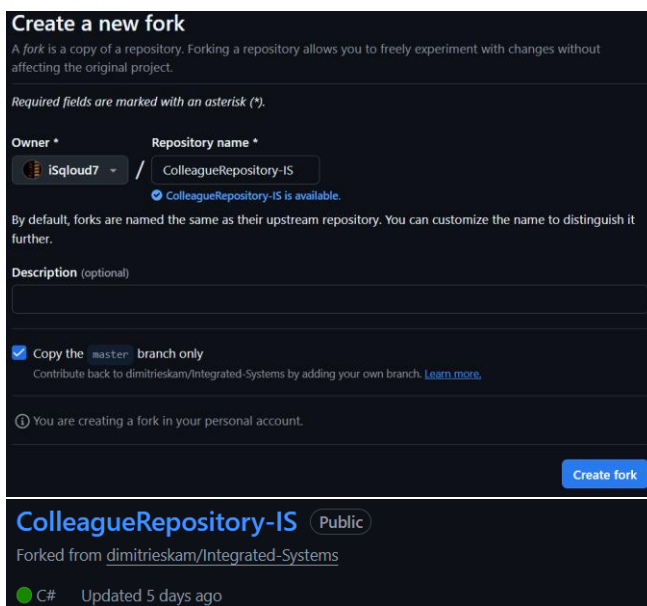> ➢ **When you're done with the branch, merge it to main. Then, commit and push to GitHub.**

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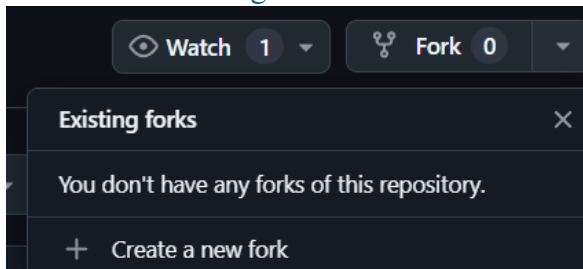
    B) We can give it another name in the Repository name field, as well as a description, and finally press **Create fork**.

  ➢ **Create a new branch for a 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
```
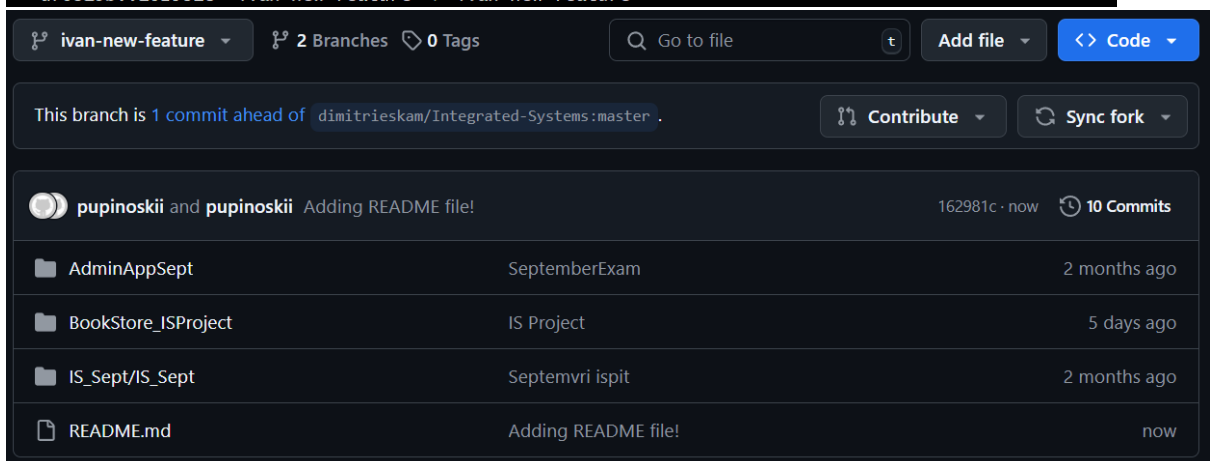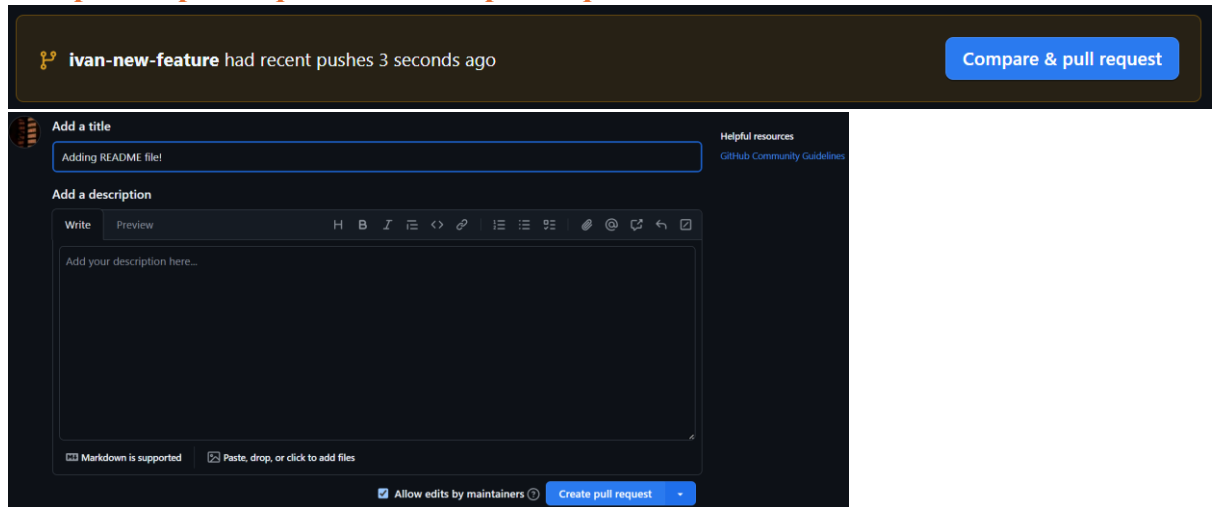
➢ **When you're done, make a Pull Request with the new feature, via GitHub's website.**
Compare & pull request -> Create pull request

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