

1. The command `git clone` can be used to clone a repository:

```
$ git clone https://github.com/BI-DS/GRA-4152.git
Cloning into 'GRA-4152'...
remote: Enumerating objects: 106, done.
remote: Counting objects: 100% (58/58), done.
remote: Compressing objects: 100% (48/48), done.
remote: Total 106 (delta 20), reused 46 (delta 10), pack-reused 48
Receiving objects: 100% (106/106), 25.14 KiB | 887.00 KiB/s, done.
Resolving deltas: 100% (29/29), done.
```

a. The command `git log --graph` can be used to see the commits

```
$ git log --graph
* commit dc730e88e9e4ad1cf94c0511b50d4d3135eb7383 (HEAD -> master, origin/master, origin/HEAD)
  Author: A1910329 <rogelio.mancisidor@gmail.com>
  Date:   Wed Oct 26 12:48:02 2022 +0200

    adding colab notebooks

* commit e5c1c97fa8aaeb1f3c377a1ecb403d16140212d5
  Author: rogelioandrade <rogelio.a.mancisidor@bi.no>
  Date:   Wed Oct 26 11:54:47 2022 +0200

    adding material lec 10

* commit ff60de77f3c18f8d0a8ee3b6918cd4db24bdf721
  Author: rogelioandrade <rogelio.a.mancisidor@bi.no>
  Date:   Wed Oct 19 11:19:43 2022 +0200

    adding material lecture 9

* commit e6ac53804aaa4bdcac8561c891e3013a8868de3c
  Author: rogelioandrade <rogelio.a.mancisidor@bi.no>
  Date:   Wed Oct 5 11:32:15 2022 +0200

    material lecture 7

* commit b412adb63d22c9f1129f195db9cddb63f945fe3
  Author: rogelioandrade <rogelio.a.mancisidor@bi.no>
  Date:   Wed Sep 28 11:49:30 2022 +0200

    adding material lecture 6

* commit 7e0089cd9e1ab59478521d31b15867377b54008f
  Author: rogelioandrade <rogelio.a.mancisidor@bi.no>
  Date:   Wed Sep 28 11:06:03 2022 +0200

    adding material for lecture 6

* commit c26010d5096e570018e4328672c45e7d54cddc69
  Author: rogelioandrade <rogelio.a.mancisidor@bi.no>
  Date:   Wed Sep 21 11:10:38 2022 +0200

    adding material for lec 5

* commit 1a4a2672f3ec0b08042a76cc54654619254a0204
  Author: rogelioandrade <rogelio.a.mancisidor@bi.no>
  Date:   Wed Sep 14 11:34:12 2022 +0200

    adding material lecture 4

* commit 9222545035a3bad8eec2c70774d6fad07066e113
  Author: rogelioandrade <rogelio.a.mancisidor@bi.no>
  Date:   Tue Sep 6 14:08:22 2022 +0200

    adding material for lecture 3

* commit 8b4efee00f04d5b3e7a4cc29269168556a9a28ad
  Author: rogelioandrade <rogelio.a.mancisidor@bi.no>
  Date:   Tue Sep 6 11:02:01 2022 +0200

    adding material for lecture 3
```

- b. The command `git log -n 1` and the file name can be used

```
$ git log -n 1 README.md
commit 71f261f8dbb09c828dfd2be1ad664a14b1fbc498
Author: rogelioandrade <rogelio.a.mancisidor@bi.no>
Date: Wed Aug 31 09:59:14 2022 +0200

    added honor code
```

- c.

As shown in the previous screenshot, the message of the commit was: Added honor code.

2.

To ignore the cloned repository, a gitignore file is created specifying that the folder GRA-4152/ will be ignore. After that the gitignore is added using the `git add` and the `git commit` command:

```
$ git add .gitignore

$ git commit -m "Added gitignore for the clone repository"
[master 548648f] Added gitignore for the clone repository
1 file changed, 1 insertion(+)
create mode 100644 .gitignore
```

3.

- a. No local changes yet.

```
$ git stash
No local changes to save
```

- b.

When used, the command shows every commit in the repo and the comment associated to it:

```
dc730e8 (HEAD -> master, origin/master, origin/HEAD) adding colab notebooks
e5c1c97 adding material lec 10
ff60de7 adding material lecture 9
e6ac538 material lecture 7
b412adb adding material lecture 6
7e0089c adding material for lecture 6
c26010d adding material for lec 5
1a4a267 adding material lecture 4
9222545 adding material for lecture 3
8b4efee adding material for lecture 3
71f261f added honor code
a610fc6 adding 1 async exercise from lecture 1
0f6036b adding 1 async exercise from lecture 1
ae45ae7 removing git_exercise.py file
84ed53d adding file for git exercise in lecture 2
37ac00f adding some py files for lecture 1
0fb7842 adding instructions for UML
20b8851 initial commit
```

c.

The command `git stash pop` applies and removes the most recent stash. This might be useful when you want your current working directory to have the changes from the stash:

d.

```
$ git stash drop
No stash entries found.
```

e.

The file `README.md` is modified adding the line `stash test`. After using `git stash`, a new stash is created:

```
$ git stash
Saved working directory and index state WIP on master: 548648f Added gitignore for the clone repository
```

After using `git stash pop`, you can see what is ready to commit and what is not ready to commit:

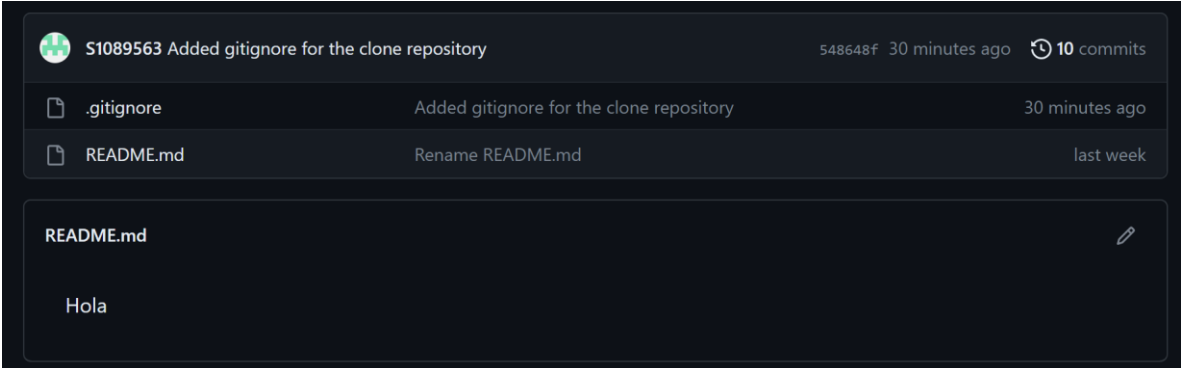
```
$ git stash pop
On branch master
Your branch is ahead of 'origin/master' by 1 commit.
  (use "git push" to publish your local commits)

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:   README.md

no changes added to commit (use "git add" and/or "git commit -a")
Dropped refs/stash@{0} (210b76cf9ccd0ad8140bc349fc2f3aa3f8a4882c)
```

Note: in this case, the commit that is not pushed yet is the `gitignore` file created at numeral 2 of this assignment.

After pushing the changes, the `README.md` is not modified in the master branch, but the changes are still visible in the working directory:



The screenshot shows a GitHub interface. At the top, a commit by user S1089563 is displayed with the message "Added gitignore for the clone repository". Below this, a table lists the files changed in the commit: `.gitignore` (Added gitignore for the clone repository) and `README.md` (Rename README.md). Below the table, the content of the `README.md` file is shown, which contains the text "Hola".

File	Change	Time
<code>.gitignore</code>	Added gitignore for the clone repository	30 minutes ago
<code>README.md</code>	Rename README.md	last week

README.md

Hola

Finally, after adding, committing and pushing the changes both the master branch and the local files have the newer version of the file:

```
$ git push -u origin master
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 4 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 287 bytes | 95.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/s1089563/GRA4152
 548648f..72ba6c6  master -> master
branch 'master' set up to track 'origin/master'.
```



The screenshot shows a GitHub repository page for 'S1089563 Stash test'. The repository has a commit hash of 72ba6c6, made 2 minutes ago, and has 11 commits. The file list shows two files: .gitignore (Added gitignore for the clone repository, 35 minutes ago) and README.md (Stash test, 2 minutes ago). The README.md file content is displayed below the list, showing the text 'Hola' and 'Stash test'.

4.

a.

A new branch is created using the git branch command:

```
$ git branch my_test_branch
```

The command switch changes the branch of the repository, using git bash, the branch can be seen here:

```
/GRA4152 (my_test_branch)
```

b.

The README.md file is change and added

```
$ git commit -m "Initial commit on my test branch"
[my_test_branch 6ecae29] Initial commit on my test branch
1 file changed, 3 insertions(+), 1 deletion(-)
```

c. First, you need to switch back to master and use git merge:

```
$ git merge my_test_branch
Updating 72ba6c6..6ecae29
Fast-forward
 README.md | 4 +++-
 1 file changed, 3 insertions(+), 1 deletion(-)
```

5.

a. The repository is fork on github and cloned using the commands in numeral 1, after that the file is pushed and pull in guthub:

