Name: Mosab Fathy Ramadan Mohamed
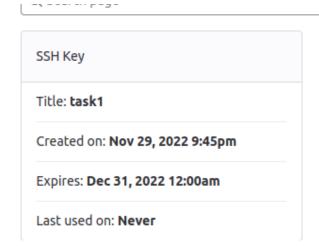**Group: B20-SD-01**
Lab 13: Git and GitLab CI/CD

1. Show how you would configure Git to connect to GitLab with SSH instead of HTTPS.

Answer:

```
iviosab@iviosab:~$ ssh-keygen -t ed25519 -C "task1"
Generating public/private ed25519 key pair.
Enter file in which to save the key (/home/iviosab/.ssh/id_ed25519):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/iviosab/.ssh/id_ed25519
Your public key has been saved in /home/iviosab/.ssh/id_ed25519.pub
The key fingerprint is:
SHA256:zKKwxWJONVGSeyE74EDsaHGnjfV/i0sbHSr+Q75YQ4w task1
```

SSH Key

ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAI

Title: **task1**

Fingerprints

Created on: **Nov 29, 2022 9:45pm**

MD5: 41:77:91:0b:37:2f:61:31:27:7d:f6

Expires: **Dec 31, 2022 12:00am**

SHA256: zKKwxWJONVGSeyE74EDsaHGnjfV/i6

Last used on: **Never**

2. What does it mean to "squash" commits?

Answer:
Squashing is a way to rewrite your commit history; this action helps to clean up and simplify your commit history before sharing your work with team members.
Squashing a commit in Git means that you are taking the changes from one commit and adding them to the Parent Commit.

3. Compare and contrast Git rebase and Git merge.

Answer:
- When you **rebase** your branch onto their branch, you tell Git to make it look as though you checked out their branch cleanly, then did all your work starting from there. That makes a clean, conceptually simple package of changes that someone can review. You can repeat this process again when there are new changes on their branch, and you will always end up with a clean set of changes "on the tip" of their branch.

- When you **merge** their branch into your branch, you tie the two branch histories together at this point. If you do this again later with more changes, you begin to create an interleaved thread of histories: some of their changes, some of my changes, some of their changes. Some people find this messy or undesirable.

4. Create a remote repository, add the remote repository to your local Git repository and do the following:
   - Create a new feature branch called `testbranch` in your local repository.
   - Make at least three commits to `testbranch`.
   - Remove the first commit you made to `testbranch`.
   - Make one commit to the `main` branch.
   - Rebase `testbranch` against your `main` branch.
   - Show the commit history of `testbranch`.
   - Merge `testbranch` to the `main` branch.
   - Show the commit history of the `main` branch.

Answer:

```
and the repository exists.
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git branch
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git config --global user.name IVIosab
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git config --global user.email mosab.f.r@gmail.com
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git config --global --list
user.name=IVIosab
user.email=mosab.f.r@gmail.com
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git remote -v
origin  https://github.com/IVIosab/sna-task4.git (fetch)
origin  https://github.com/IVIosab/sna-task4.git (push)
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git pull origin main
Username for 'https://github.com': IVIosab
Password for 'https://IVIosab@github.com':
From https://github.com/IVIosab/sna-task4
 * branch            main       -> FETCH_HEAD
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git branch
* main
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git checkout -b
error: switch `b' requires a value
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git checkout -b testbranch
Switched to a new branch 'testbranch'
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ touch c1.txt
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ touch c2.txt
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ touch c3.txt
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git add c1.txt
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git status
On branch testbranch
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        new file:   c1.txt

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        c2.txt
        c3.txt

iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git commit -m "commit 1"
[testbranch 6f7c47a] commit 1
 1 file changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 c1.txt
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git add c2.txt
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git commit -m "commit 2"
[testbranch 944171c] commit 2
 1 file changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 c2.txt
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git add c3.txt
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git commit -m "commit 3"
[testbranch 839f876] commit 3
 1 file changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 c3.txt
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git log
commit 839f87615434607c50e03c01d1916f17b9dbc77e (HEAD -> testbranch)
Author: IVIosab <mosab.f.r@gmail.com>
Date:   Wed Nov 30 00:57:27 2022 +0300
```

```
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git log
commit 839f87615434607c50e03c01d1916f17b9dbc77e (HEAD -> testbranch)
Author: IVIosab <mosab.f.r@gmail.com>
Date:   Wed Nov 30 00:57:27 2022 +0300

    commit 3

commit 944171cc28a276e2342ae5c2742e4691db7a9aad
Author: IVIosab <mosab.f.r@gmail.com>
Date:   Wed Nov 30 00:57:18 2022 +0300

    commit 2

commit 6f7c47aac0e070eb25db3bb094b0efbbf923c65b
Author: IVIosab <mosab.f.r@gmail.com>
Date:   Wed Nov 30 00:57:02 2022 +0300

    commit 1

commit a6407afee1612b4881cb558a37324037d12680f4 (origin/main, main)
Author: Mosab Mohamed <mosab.f.r@gmail.com>
Date:   Wed Nov 30 00:48:56 2022 +0300

    Initial commit
:...skipping...
```

```
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git rebase -i HEAD~3
Successfully rebased and updated refs/heads/testbranch.
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git log
commit 2ba605b54ea1ad2f21df4b91fde9682b9be44f28 (HEAD -> testbranch)
Author: IVIosab <mosab.f.r@gmail.com>
Date:   Wed Nov 30 00:57:27 2022 +0300

    commit 3

commit 33423e52e452e788c3b2879579561bc395f72c55
Author: IVIosab <mosab.f.r@gmail.com>
Date:   Wed Nov 30 00:57:18 2022 +0300

    commit 2

commit a6407afee1612b4881cb558a37324037d12680f4 (origin/main, main)
Author: Mosab Mohamed <mosab.f.r@gmail.com>
Date:   Wed Nov 30 00:48:56 2022 +0300

    Initial commit
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git checkout main
Switched to branch 'main'
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ touch commit-to-main.txt
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git add commit-to-main.txt
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git commit -m "commit to main"
[main 0fd030e] commit to main
 1 file changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 commit-to-main.txt
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git rebase testbranch
Successfully rebased and updated refs/heads/main.
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git log
commit 2987c5bcb543ea5d32fce5460390536740a716f7 (HEAD -> main)
Author: IVIosab <mosab.f.r@gmail.com>
Date:   Wed Nov 30 01:00:28 2022 +0300

    commit to main

commit 2ba605b54ea1ad2f21df4b91fde9682b9be44f28 (testbranch)
Author: IVIosab <mosab.f.r@gmail.com>
Date:   Wed Nov 30 00:57:27 2022 +0300

    commit 3

commit 33423e52e452e788c3b2879579561bc395f72c55
Author: IVIosab <mosab.f.r@gmail.com>
Date:   Wed Nov 30 00:57:18 2022 +0300

    commit 2

commit a6407afee1612b4881cb558a37324037d12680f4 (origin/main)
Author: Mosab Mohamed <mosab.f.r@gmail.com>
Date:   Wed Nov 30 00:48:56 2022 +0300

    Initial commit
```

```
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git merge testbranch
Already up to date.
iviosab@iviosab:~/Desktop/GitHub/sna-task4$ git log main
commit 2987c5bcb543ea5d32fce5460390536740a716f7 (HEAD -> main)
Author: IVIosab <mosab.f.r@gmail.com>
Date:   Wed Nov 30 01:00:28 2022 +0300

    commit to main

commit 2ba605b54ea1ad2f21df4b91fde9682b9be44f28 (testbranch)
Author: IVIosab <mosab.f.r@gmail.com>
Date:   Wed Nov 30 00:57:27 2022 +0300

    commit 3

commit 33423e52e452e788c3b2879579561bc395f72c55
Author: IVIosab <mosab.f.r@gmail.com>
Date:   Wed Nov 30 00:57:18 2022 +0300

    commit 2

commit a6407afee1612b4881cb558a37324037d12680f4 (origin/main)
Author: Mosab Mohamed <mosab.f.r@gmail.com>
Date:   Wed Nov 30 00:48:56 2022 +0300

    Initial commit
```

5. Create a Dockerized application written in C/C++, python, java, or nodejs, and host the source code on GitLab. Create a GitLab CI/CD pipeline to trigger when there is a push. The pipeline should do the following:
   - Build the docker image.
   - Test the build (Create a test that is relevant to your application).
   - Publish the docker image to Dockerhub upon successful test.
   - Deploy the application on your server.

   Show all job build logs from the pipeline in the form of screenshots.

Answer:

test
Mosab Mohamed authored 28 minutes ago

06ee7db:

| main ⌄ | test / tests / test.py | Find file | Blame | History | P |

🐍 **test.py** 📋 59 bytes | Open in Web IDE ⌄ | Lock | Replace | Delete | 📋 |

```python
1
2  def test_assert_5():
3      print(5)
4
5      assert 5 == 5
6
7
```

```
Dockerfile ✕
Dockerfile
1   FROM python:alpine
2
3   WORKDIR /app
4
5   COPY requirements.txt .
6
7   RUN pip install --no-cache-dir -r requirements.txt \
8       && addgroup -S app && adduser -S app -G app \
9       && chown -R app:app .
10
11  COPY . .
12
13  USER app
14
15  CMD ["python", "main.py"]
```

```
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git init
hint: Using 'master' as the name for the initial branch. This default branch name
hint: is subject to change. To configure the initial branch name to use in all
hint: of your new repositories, which will suppress this warning, call:
hint:
hint:   git config --global init.defaultBranch <name>
hint:
hint: Names commonly chosen instead of 'master' are 'main', 'trunk' and
hint: 'development'. The just-created branch can be renamed via this command:
hint:
hint:   git branch -m <name>
Initialized empty Git repository in /home/iviosab/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test/.git/
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git remote add origin https://gitlab.com/myfi
rstgroup231/test.git
git branch -M main
git push -uf origin main
error: src refspec main does not match any
error: failed to push some refs to 'https://gitlab.com/myfirstgroup231/test.git'
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git remote add origin https://gitlab.com/myfi
rstgroup231/test.git
error: remote origin already exists.
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git branch -M main
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git branch
```

```
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git branch -M main
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git branch
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git pull
Username for 'https://gitlab.com': IVIosab
Password for 'https://IVIosab@gitlab.com':
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git pull
Username for 'https://gitlab.com': IVIosab
Password for 'https://IVIosab@gitlab.com':
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), 2.77 KiB | 2.77 MiB/s, done.
From https://gitlab.com/myfirstgroup231/test
 * [new branch]      main       -> origin/main
There is no tracking information for the current branch.
Please specify which branch you want to merge with.
See git-pull(1) for details.

    git pull <remote> <branch>

If you wish to set tracking information for this branch you can do so with:

    git branch --set-upstream-to=origin/<branch> main
```

```
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git branch -M main
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git branch
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ ls
Dockerfile  my_account.session  README.md        tests     venv
main.py     __pycache__         requirements.txt  TODO.txt
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ cat README.md
# Telegram_bot_to_access_remote_server
Telegram bot to access a remote server
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ ls
Dockerfile  my_account.session  requirements.txt  TODO.txt
main.py     __pycache__         tests             venv
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git pull
Username for 'https://gitlab.com': IVIosab
Password for 'https://IVIosab@gitlab.com':
There is no tracking information for the current branch.
Please specify which branch you want to merge with.
See git-pull(1) for details.

    git pull <remote> <branch>

If you wish to set tracking information for this branch you can do so with:

    git branch --set-upstream-to=origin/<branch> main
```

```
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git pull origin main
Username for 'https://gitlab.com': IVIosab
Password for 'https://IVIosab@gitlab.com':
From https://gitlab.com/myfirstgroup231/test
 * branch          main       -> FETCH_HEAD
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git branch
* main
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git branch -M main
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git branch
* main
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git push -uf origin main
Username for 'https://gitlab.com': IVIosab
Password for 'https://IVIosab@gitlab.com':
Branch 'main' set up to track remote branch 'main' from 'origin'.
Everything up-to-date
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git add .
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git commit -m "test"
[main 06ee7db] test
 6 files changed, 71 insertions(+)
 create mode 100644 .gitignore
 create mode 100644 Dockerfile
 create mode 100644 main.py
 create mode 100644 requirements.txt
```

```
Branch 'main' set up to track remote branch 'main' from 'origin'.
Everything up-to-date
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git add .
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git commit -m "test"
[main 06ee7db] test
 6 files changed, 71 insertions(+)
 create mode 100644 .gitignore
 create mode 100644 Dockerfile
 create mode 100644 main.py
 create mode 100644 requirements.txt
 create mode 100644 tests/__init__.py
 create mode 100644 tests/test.py
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$ git push origin main
Username for 'https://gitlab.com': IVIosab
Password for 'https://IVIosab@gitlab.com':
Enumerating objects: 10, done.
Counting objects: 100% (10/10), done.
Delta compression using up to 12 threads
Compressing objects: 100% (8/8), done.
Writing objects: 100% (9/9), 1.29 KiB | 662.00 KiB/s, done.
Total 9 (delta 0), reused 0 (delta 0), pack-reused 0
To https://gitlab.com/myfirstgroup231/test.git
   97ebc36..06ee7db  main -> main
iviosab@iviosab:~/Desktop/GitHub/Telegram_bot_to_access_remote_server/Test$
```

Browse templates | (i) Help

```
18
19    stages:          # List of stages for jobs, and their order of execution
20      - build
21      - test
22      - deploy
23
24    build:
25      image: docker:20.10.16
26      services:
27        - docker:20.10.16-dind
28      script:
29        - docker build -t iviosab/test .
30
31    test:    # This job runs in the test stage.
32      image: python:alpine    # It only startdsadas when the job in the build stage completes successfully.
33      needs: [ build ]
34      script:
35        - pip install -r requirements.txt
36        - pytest tests/test.py
37
38    deploy:       # This job runs in the deploy stage.
39      image: docker:20.10.16  # It only runs when *both* jobs in the test stage complete successfully.
40      needs: [ test ]
41      services:
42        - docker:20.10.16-dind
43      script:
```

Browse templates | (i) Help

```
21      - test
22      - deploy
23
24    build:
25      image: docker:20.10.16
26      services:
27        - docker:20.10.16-dind
28      script:
29        - docker build -t iviosab/test .
30
31    test:    # This job runs in the test stage.
32      image: python:alpine    # It only startdsadas when the job in the build stage completes successfully.
33      needs: [ build ]
34      script:
35        - pip install -r requirements.txt
36        - pytest tests/test.py
37
38    deploy:       # This job runs in the deploy stage.
39      image: docker:20.10.16  # It only runs when *both* jobs in the test stage complete successfully.
40      needs: [ test ]
41      services:
42        - docker:20.10.16-dind
43      script:
44        - docker login -u iviosab -p $DOCKERHUB_TOKEN
45        - docker build -t iviosab/test .
46        - docker push iviosab/test
```

Build:

```
108  Removing intermediate container 50f20a1cd504
109   ---> c617b1d1e0c2
110  Step 5/7 : COPY . .
111   ---> fdd9a23c4715
112  Step 6/7 : USER app
113   ---> Running in 27ec32f94dbe
114  Removing intermediate container 27ec32f94dbe
115   ---> 9238a1f8affa
116  Step 7/7 : CMD ["python", "main.py"]
117   ---> Running in 9a63b6aadac2
118  Removing intermediate container 9a63b6aadac2
119   ---> ad66fad964ed
120  Successfully built ad66fad964ed
121  Successfully tagged iviosab/test:latest
123  Cleaning up project directory and file based variables
125  Job succeeded
```

Test:

```
63  Successfully built pyaes
64  Installing collected packages: pyaes, iniconfig, tomli, TgCrypto, python-dotenv, PySocks, pyparsing, pluggy, exceptiongroup, attrs, Pyrogram, packag
    ing, pytest
65  Successfully installed PySocks-1.7.1 Pyrogram-2.0.62 TgCrypto-1.2.5 attrs-22.1.0 exceptiongroup-1.0.4 iniconfig-1.1.1 packaging-21.3 pluggy-1.0.0 py
    aes-1.6.1 pyparsing-3.0.9 pytest-7.2.0 python-dotenv-0.21.0 tomli-2.0.1
66  WARNING: Running pip as the 'root' user can result in broken permissions and conflicting behaviour with the system package manager. It is recommende
    d to use a virtual environment instead: https://pip.pypa.io/warnings/venv
67  [notice] A new release of pip available: 22.3 -> 22.3.1
68  [notice] To update, run: pip install --upgrade pip
69  $ pytest tests/test.py
70  ============================ test session starts ============================
71  platform linux -- Python 3.11.0, pytest-7.2.0, pluggy-1.0.0
72  rootdir: /builds/myfirstgroup231/test
73  collected 1 item
74  tests/test.py .                                                        [100%]
75  ============================ 1 passed in 0.01s ============================
77  Cleaning up project directory and file based variables                    00:00
79  Job succeeded
```

Deploy:

```
127  Successfully tagged iviosab/test:latest
128  $ docker push iviosab/test
129  Using default tag: latest
130  The push refers to repository [docker.io/iviosab/test]
131  03c520157825: Preparing
132  81ca63efab2c: Preparing
133  29928ffbfbd5: Preparing
134  a508bb9c77d3: Preparing
135  4a365497c549: Preparing
136  de25f2457309: Preparing
137  421e09301df6: Preparing
138  3ebf1ad0dea4: Preparing
139  ded7a220bb05: Preparing
140  de25f2457309: Waiting
141  421e09301df6: Waiting
142  3ebf1ad0dea4: Waiting
143  ded7a220bb05: Waiting
144  4a365497c549: Mounted from library/python
145  a508bb9c77d3: Pushed
146  29928ffbfbd5: Pushed
147  03c520157825: Pushed
148  de25f2457309: Mounted from library/python
149  421e09301df6: Mounted from library/python
150  3ebf1ad0dea4: Mounted from library/python
151  ded7a220bb05: Mounted from library/python
152  81ca63efab2c: Pushed
153  latest: digest: sha256:d317eb5dbb6a71b867029f6861ada12d1cecf3dd443c7c12f5b3cbc09c60132d size: 2202
155  Cleaning up project directory and file based variables                    00:00
157  Job succeeded
```