



HY-255

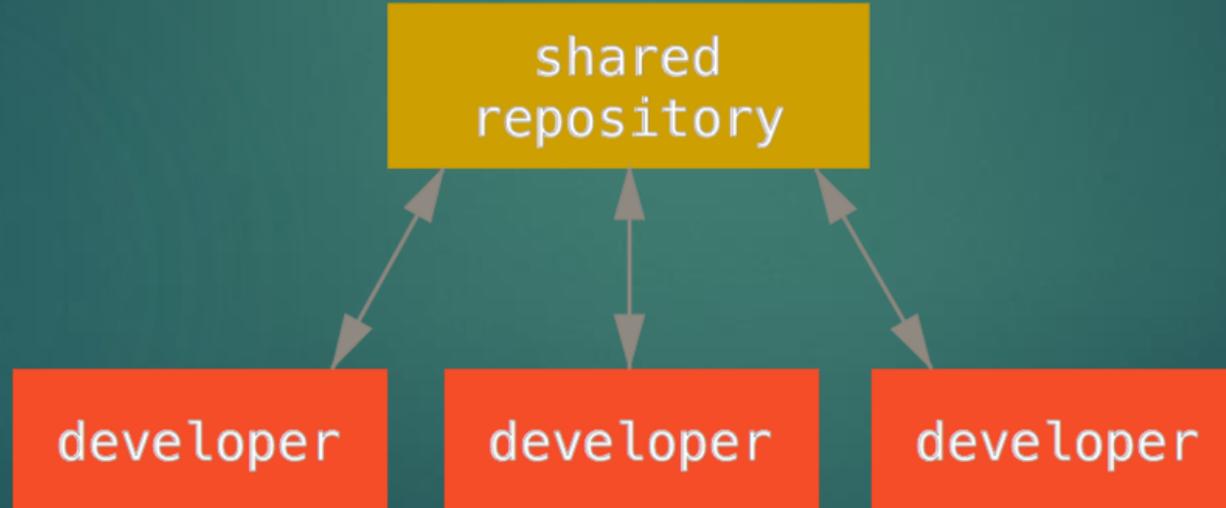
Git Tutorial

# Outline

- ▶ What is git
- ▶ How to join HY-255 group
- ▶ What are ssh keys and how to use them
- ▶ How to fork a project
- ▶ Make project private and add TAs as members
- ▶ How to use private.py
- ▶ How to use git

# What is git?

- ▶ Version control system
- ▶ Track file history
- ▶ Shared among multiple users



# How to join HY-255 group

The screenshot shows the GitLab interface with the 'Groups' menu selected. A red box highlights the 'Explore groups' button, and a red number '1' is placed to its left. The search bar contains the text 'Search your groups'. Below the search bar, there is a section for 'Frequently visited' groups.

The screenshot shows the 'Groups' page with the 'Explore public groups' tab selected. A blue banner at the top states: 'Below you will find all the groups that are public. You can easily contribute to them by requesting to join these groups.' A red box highlights the 'CS255' group, and a red number '2' is placed to its left. The list of groups includes:

Group Name	Description	Members
CS255	CS255 Programming Lab Spring 2021, Department of Computer Science, University of Crete ( <a href="https://www.csd.uoc.gr/~hy255/">https://www.csd.uoc.gr/~hy255/</a> ) Instructor: Prof. ...	96
hy359-2020	Hello! This is the 2020 group for Web Programming (hy359) course	129
hy463-2020-themis		1
hy359-2019	Hello hy359 travellers! This is the assignments/sprint group for the 2019 Web Programming course	153
Ext		1
Last		3
Group TAs test		1
Group test		3
hy359-2018	Hello hy359 astronauts! This is the assignments/sprint group for the 2018 Web Programming course	115
TAs-HYXX-2018		2
HYXX-2018		2
HYXX-2018-test2		4

# How to join HY-255 group

The screenshot shows the GitLab interface for the CS255 group. The left sidebar contains navigation options: Group overview, Details (selected), Activity, Issues (0), Merge Requests (0), and Members. The main content area displays the group details for CS255, including the group ID (441) and a 'Request Access' button, which is highlighted with a red box and the number '3' above it. Below this, the group description is provided: 'CS255 Programming Lab Spring 2021, Department of Computer Science, University of Crete (https://www.csd.uoc.gr/~hy255/)' and 'Instructor: Prof. Angelos Bilas (http://www.csd.uoc.gr/~bilas)'. A section titled 'Subgroups and projects' is visible, with filters for 'Shared projects' and 'Archived projects'. A search bar and a 'Last created' dropdown are also present. The list of projects includes assignments from 'hy255\_as6' to 'hy255\_as0', each with a star icon and a creation date.

Project Name	Description	Stars	Created
hy255_as6	Assignment 6: Systems Security: Buffer Overrun Attack (https://www.csd.uoc.gr/~hy...)	0	4 days ago
hy255_as5	Assignment 5: C and Assembly Code Tutorial: Computing Sums (https://www.csd.uo...)	0	4 days ago
hy255_as4	Assignment 4: Sudoku checker, solver, and generator (https://www.csd.uoc.gr/~hy25...)	0	4 days ago
hy255_as3	Assignment 3: ADTs: Abstract Data Types (Symbol Table) (https://www.csd.uoc.gr/~...)	0	4 days ago
hy255_as2	Assignment 2: A string module (https://www.csd.uoc.gr/~hy255/as2)	0	4 days ago
hy255_as1	Assignment 1: Translate Program (https://www.csd.uoc.gr/~hy255/as1)	0	2 days ago
hy255_as0	Assignment 0	0	4 days ago

# Generating ssh-keys

- ▶ `ssh-keygen -t rsa -b 2048 -C "csdemail@csd.uoc.gr"`
- ▶ Press enter in the next three options

```
Generating public/private rsa key pair.  
Enter file in which to save the key (/home/gxanth/.ssh/id_rsa):  
Enter passphrase (empty for no passphrase):  
Enter same passphrase again:
```

# Generating ssh-keys

- ▶ Run `cat .ssh/id_rsa.pub`
- ▶ Copy the printed text

```
Enter same passphrase again:
Your identification has been saved in /home/gxanth/.ssh/id_rsa
Your public key has been saved in /home/gxanth/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:bKnYBc7oJ27tM6AAz9c7LFtjAlbT5Yn/f3aj810DC14 gxanth@csd.uoc.gr
The key's randomart image is:
```

```
+---[RSA 2048]-----+
```

```
|
| . + .
|  o + o
|. . = + .
|.oo ..o S .
|..0000.+ . . E ..|
| . o=+B.  o o . o|
| ..o*B.  o 000.|
| .o+.+ .++00|
```

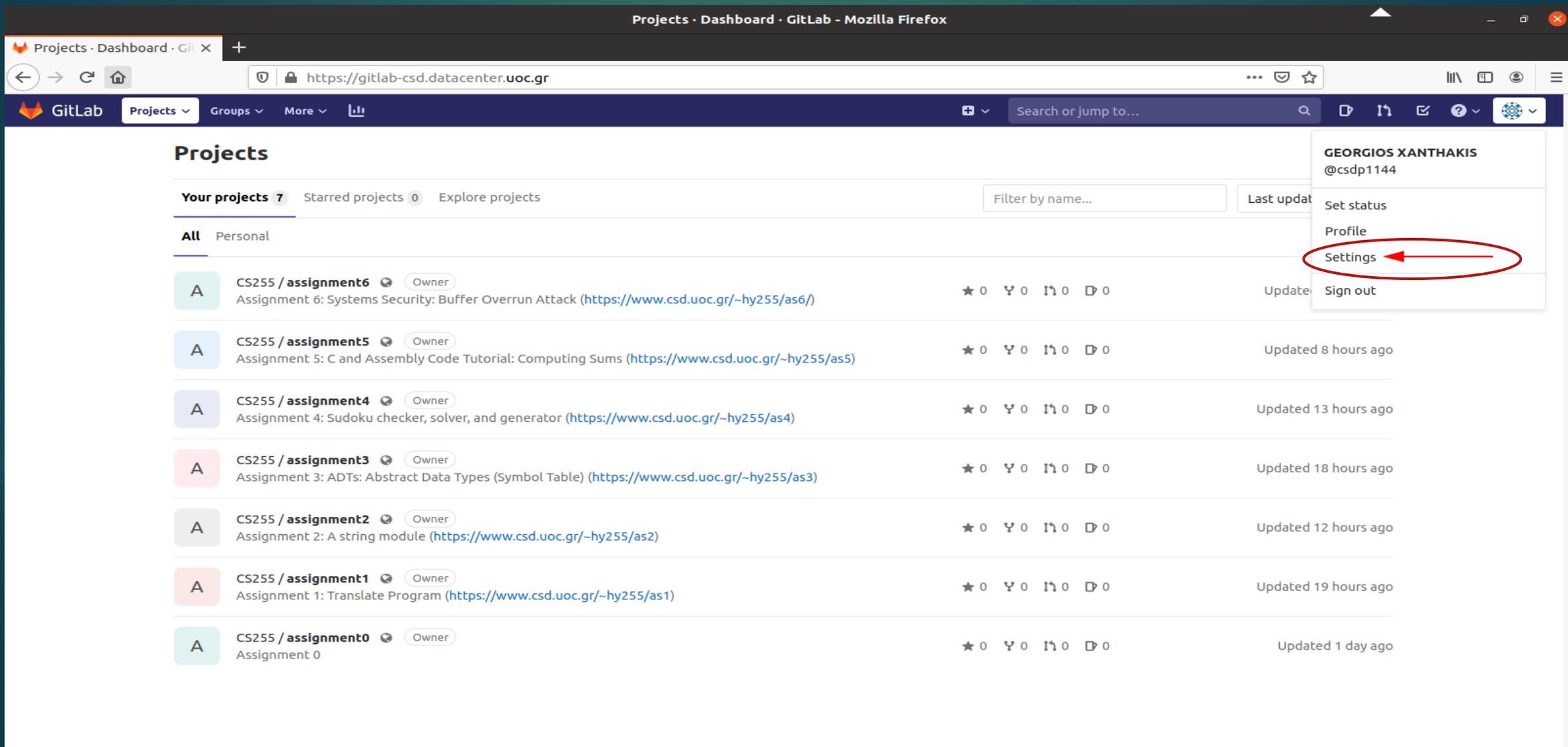
```
+-----[SHA256]-----+
```

```
gxanth@gxanth:~$ cat .ssh/id_rsa.pub
```

```
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQAC+IvR0xk67Yom1VGLK1W1TsRxIeQW+bs3YQod53KsC
HtrymM7sAkUBt2RXovZm99c4KHwCyIWOIZ4KiMuXMWLJUtxfImh0jG+PQdRtD1N5pY9895kDg+Hlv2sI
NojIf/2ecfGG1QTB15Vbw6cmwLssea8pXwQeMffiyVvVJWEASKvc/YbiQQcgzaIbg4U42npGItdk+xv5
hiS80GGdhuQHfFJx2GqccsZYBKGX4duV+HUIemhcVK16zp+Jj7J2S5lv0qUTxZU+1xT+ezec1Z7n58bx
BfzRiODr729gOAZFMVvVuMXhLFwdhDeHv8uXOMF6SvsRATFiBy/mss0KBixD gxanth@csd.uoc.gr
```

# Add ssh-keys in your account

▶ Go to settings



The screenshot shows the GitLab Projects dashboard in a Mozilla Firefox browser. The user is logged in as GEORGIOS XANTHAKIS (@csdp1144). A dropdown menu is open, showing options: Set status, Profile, Settings (highlighted with a red circle and arrow), and Sign out. The main content area displays a list of projects under the 'Your projects' tab, including 'assignment6' through 'assignment0'.

**Projects**

Your projects 7 | Starred projects 0 | Explore projects

Filter by name... | Last updated

All | Personal

Project Name	Owner	Stars	Forks	Issues	Discussions	Last Updated
CS255 / assignment6	Owner	0	0	0	0	Updated 8 hours ago
CS255 / assignment5	Owner	0	0	0	0	Updated 13 hours ago
CS255 / assignment4	Owner	0	0	0	0	Updated 18 hours ago
CS255 / assignment3	Owner	0	0	0	0	Updated 12 hours ago
CS255 / assignment2	Owner	0	0	0	0	Updated 19 hours ago
CS255 / assignment1	Owner	0	0	0	0	Updated 1 day ago
CS255 / assignment0	Owner	0	0	0	0	Updated 1 day ago

# Add ssh-keys in your account

The screenshot shows the GitLab user settings interface. The browser address bar displays `https://gitlab-csd.datacenter.uoc.gr/profile`. The left sidebar contains a list of settings categories: Profile, Account, Applications, Chat, Access Tokens, Emails, Notifications, SSH Keys, GPG Keys, Preferences, Active Sessions, and Authentication log. The 'SSH Keys' option is circled in red with a red arrow pointing to it. The main content area is titled 'User Settings > Edit Profile' and includes sections for 'Public Avatar', 'Current status', 'Main settings', and 'Your status'. The 'Your status' section contains a text input field with the placeholder text 'What's your status?' and a close button. The 'Main settings' section includes fields for 'Full name' (GEORGIOS XANTHAKIS), 'Email' (csdp1144@csd.uoc.gr), and 'Public email' (Do not show on profile).

Activities Firefox Web Browser

Φεβ 10 22:11

User Settings · GitLab - Mozilla Firefox

User Settings · GitLab

GitLab Projects Groups More

User Settings

Profile

Account

Applications

Chat

Access Tokens

Emails

Notifications

SSH Keys

GPG Keys

Preferences

Active Sessions

Authentication log

User Settings > Edit Profile

Public Avatar

You can upload your avatar here or change it at [gravatar.com](https://gravatar.com)

Upload new avatar

Choose file... No file chosen

The maximum file size allowed is 200KB.

Current status

This emoji and message will appear on your profile and throughout the interface.

Your status

What's your status?

Main settings

This information will appear on your profile. Some options are unavailable for LDAP accounts.

Full name

GEORGIOS XANTHAKIS

User ID

404

Email

csdp1144@csd.uoc.gr

Your email address was automatically set based on your LDAP account.

Public email

Do not show on profile

This email will be displayed on your public profile.

Commit email

csdp1144@csd.uoc.gr

This email will be used for web based operations, such as edits and merges. [Learn more](#)

Skype

<< Collapse sidebar

# Add ssh-keys in your account

- ▶ Copy your ssh key in 1 and add your key with 2.

**User Settings**

- Profile
- Account
- Applications
- Chat
- Access Tokens
- Emails
- Notifications
- SSH Keys**
- GPG Keys
- Preferences
- Active Sessions
- Authentication log

User Settings > **SSH Keys**

### SSH Keys

SSH keys allow you to establish a secure connection between your computer and GitLab.

#### Add an SSH key

To add an SSH key you need to [generate one](#) or use an [existing key](#).

#### Key

Paste your public SSH key, which is usually contained in the file '~/.ssh/id\_ed25519.pub' or '~/.ssh/id\_rsa.pub' and begins with 'ssh-ed25519' or 'ssh-rsa'. Don't use your private SSH key.

```
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAQAC+ivROXk67Yom1VGLK1W1TsRxleQW+bs3YQod53Ks
CHtryM7sAkUBt2RXovZm99c4KHwCylWOIZ4KimuXMWLJUtXflmh0jG+PQdRtD1N5pY9895kD
g+Hlv2sINojlf/2ecfGG1QTB15Vbw6cmwLssea8pXwQeMffiyVvVJWEASkvc
/YbiQQcgzaibg4U42npGldk+xv5hiS8OGGdhuQHffJx2GqccsZYBKGX4duV+HUIemhcVK16zp+Jj
7J2S5lv0qUTxZU+1xT+ezec1Z7n58bxBfzRiODr729gOAzFMVvVuMXhLFwdhDeHv8uXOMF6SvsR
ATFiBy/mssOKBixD gxanth@csd.uoc.gr
```

**Title**  **Expires at**

Give your individual key a title

**Add key**

#### Your SSH keys (0)

There are no SSH keys with access to your account.

# How to fork a repo

The screenshot shows the GitLab interface for a repository named 'hy255\_as1'. The top navigation bar includes the GitLab logo, 'Projects', 'Groups', and 'More' menus, along with a search bar and utility icons. The left sidebar contains navigation options: Project overview, Details, Activity, Releases, Repository, Issues (0), Merge Requests (0), Packages, Analytics, Wiki, Snippets, and Settings. The main content area displays the repository details for 'hy255\_as1' (Project ID: 1734). It shows 5 commits, 1 branch, 0 tags, 307 KB files, and 307 KB storage. A red arrow points to the 'Fork' button, which is located next to the 'Star' button (0 stars) and a notification bell. Below the repository header, there is a commit history section showing the most recent commit: 'Update README.md' by Jack Kolokasis, authored 3 days ago, with commit hash e09c9ea1. Below the commit history, there are buttons for 'README', 'Auto DevOps enabled', 'Add LICENSE', 'Add CHANGELOG', and 'Add CONTRIBUTING'. A table lists the repository's files and their last commit details:

Name	Last commit	Last update
src	Init commit	1 week ago
tests	Init commit	1 week ago
.gitignore	Add Readme	1 week ago
Makefile	Update Makefile	1 week ago
README.md	Update README.md	3 days ago
private.py	Add private.py script	3 days ago

At the bottom of the page, the title 'Assignment1: Translate Program' is visible.

# How to fork a repo

GitLab Projects Groups More

CS255 > hy255\_as1 > Fork project

## Fork project

Select a namespace to fork the project

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

GEORGIOS XANTHAKIS

- Project overview
- Repository
- Issues 0
- Merge Requests 0
- Packages
- Analytics
- Wiki
- Snippets
- Settings

# Info about fork

- ▶ You need to fork each assignment only once!
- ▶ If you want to download your project in different devices you need to clone

# What happens when you do not use private.py

- ▶ To make the project private
  - ▶ Go to Project Settings -> General
  - ▶ Visibility
  - ▶ Change Project Visibility to Private
- ▶ To add the TAs in your project
  - ▶ Go to Project Settings -> Members
  - ▶ Add each TA as a Developer
- ▶ But we can avoid doing these steps on every assignment

# Using private.py

- ▶ Run `pip3 install --upgrade python-gitlab --user`
- ▶ Copy your access token and the assignment's project id

The screenshot displays the GitLab web interface for a project named 'hy255\_as1'. The interface includes a navigation sidebar on the left with options like 'Project overview', 'Details', 'Activity', 'Releases', 'Repository', 'Issues', 'Merge Requests', 'Packages', 'Analytics', 'Wiki', 'Snippets', and 'Settings'. The main content area shows the project's details, including a notification that the project was successfully forked, the project name 'hy255\_as1' with its ID '1781' circled in red, and a red arrow pointing to the ID. Below this, there are statistics for commits, branches, tags, files, and storage. A commit history section shows a recent commit 'Update README.md' by Jack Kolokasis. At the bottom, a terminal window shows the command `python3 private.py -t qKyZ5HM-Vxb63JFhFYJ6 -p 1781` being executed. The terminal output shows the command's arguments: 'Access Token' and 'Project ID'.

# Generating an Access Token

The screenshot shows the GitLab web interface. At the top, there's a navigation bar with the GitLab logo, 'Projects', 'Groups', and 'More' dropdowns. A search bar is on the right. Below the navigation, the 'Projects' section is visible, showing a list of projects under the 'Your projects' tab. The sidebar on the right shows the user profile for 'GEORGIOS XANTHAKIS' with options for 'Set status', 'Profile', 'Settings', and 'Sign out'. The 'Settings' option is circled in white, and a red arrow points to it from the right.

**Projects** New project

Your projects 24 Starred projects 0 Explore projects  Last updated ▾

All Personal

H	EVANGELOS YFANTIS / <b>hy255_as1</b> <span>Developer</span>	★ 0	👤 0	🔗 0	📄 0	Updated 3 hours ago
H	ALEXANDROS EMMANOUIL ANTONAKAKIS / <b>hy255_as1</b> <span>Developer</span>	★ 0	👤 0	🔗 0	📄 0	Updated 3 hours ago
H	ELEFThERIOS NTAFOtIS KONTOGIANNIS / <b>hy255_as1</b> <span>Developer</span>	★ 0	👤 0	🔗 0	📄 0	Updated 3 hours ago
H	IASON FILIPPOS NTAGIANNIS / <b>hy255_as1</b> <span>Developer</span>	★ 0	👤 0	🔗 0	📄 0	Updated 7 hours ago
H	CHRISTINA REPOU / <b>hy255_as1</b> <span>Developer</span>	★ 0	👤 0	🔗 0	📄 0	Updated 8 hours ago
H	ALEXANDROS GKEKAS / <b>hy255_as1</b> <span>Developer</span>	★ 0	👤 0	🔗 0	📄 0	Updated 10 hours ago
H	EMMANOUIL FILIPPAKIS / <b>hy255_as1</b> <span>Developer</span>	★ 0	👤 0	🔗 0	📄 0	Updated 23 hours ago
H	THEODORA SABALOU / <b>hy255_as1</b> <span>Developer</span>	★ 0	👤 0	🔗 0	📄 0	Updated 1 day ago
H	ALEXANDROS PAPADOPOULOS / <b>hy255_as1</b> <span>Developer</span>	★ 0	👤 0	🔗 0	📄 0	Updated 1 day ago
H	AUREL SHEHAJ / <b>hy255_as1</b> <span>Developer</span>	★ 0	👤 0	🔗 0	📄 0	Updated 1 day ago

GEORGIOS XANTHAKIS  
@csdp1144

Set status

Profile

**Settings**

Sign out

# Generating an Access Token

The screenshot shows the GitLab user interface. At the top, the GitLab logo and navigation menu are visible. The left sidebar contains the 'User Settings' menu, with 'Access Tokens' highlighted by a red circle and arrow. The main content area is titled 'User Settings > Edit Profile'. It features a 'Public Avatar' section with a circular profile picture and an 'Upload new avatar' button. Below this is the 'Current status' section with a status input field. The 'Main settings' section includes fields for 'Full name' (GEORGIOS XANTHAKIS), 'User ID' (404), 'Email' (csdp1144@csd.uoc.gr), and 'Public email' (Do not show on profile). The 'Commit email' field is also visible, set to csdp1144@csd.uoc.gr.

# Generating an Access Token

The screenshot shows the GitLab User Settings page for 'Access Tokens'. A notification at the top states 'Revoked personal access token test!'. The main section is titled 'Personal Access Tokens' and includes instructions on how to generate and use them. The 'Add a personal access token' form is highlighted with a red box and contains the following fields:

- Name:** A text input field containing 'my\_token', marked with a red box and the number '1'.
- Expires at:** A date input field with the placeholder 'YYYY-MM-DD'.
- Scopes:** A list of checkboxes, all of which are checked and highlighted with a red box and the number '2':
  - api**: Grants complete read/write access to the API, including all groups and projects, the container registry, and the package registry.
  - read\_user**: Grants read-only access to the authenticated user's profile through the /user API endpoint, which includes username, public email, and full name. Also grants access to read-only API endpoints under /users.
  - read\_api**: Grants read access to the API, including all groups and projects, the container registry, and the package registry.
  - read\_repository**: Grants read-only access to repositories on private projects using Git-over-HTTP or the Repository Files API.
  - write\_repository**: Grants read-write access to repositories on private projects using Git-over-HTTP (not using the API).
  - read\_registry**: Grants read-only access to container registry images on private projects.
  - write\_registry**: Write Registry.

Below the form, a green button labeled 'Create personal access token' is highlighted with a red box and the number '3', with a red arrow pointing to it from the left. Below this button, a section titled 'Active Personal Access Tokens (0)' contains a message: 'This user has no active Personal Access Tokens.' At the bottom, there is a 'Feed token' section with a text input field containing 'ZcWEsCXZG-sd1zFkCywt' and a note: 'Keep this token secret. Anyone who gets ahold of it can read activity and issue RSS feeds or your calendar feed as if they were you. You should reset it if that ever happens.'

# Generating an Access Token

User Settings > Access Tokens

Your new personal access token has been created.

### Personal Access Tokens

You can generate a personal access token for each application you use that needs access to the GitLab API.

You can also use personal access tokens to authenticate against Git over HTTP. They are the only accepted password when you have Two-Factor Authentication (2FA) enabled.

#### Your New Personal Access Token

qKyZ5HM-Vxb63JFhFYJ6

Make sure you save it - you won't be able to access it again.

**COPY THIS**

Save this in a file for future use

#### Add a personal access token

Pick a name for the application, and we'll give you a unique personal access token.

**Name**

**Expires at**

**Scopes**

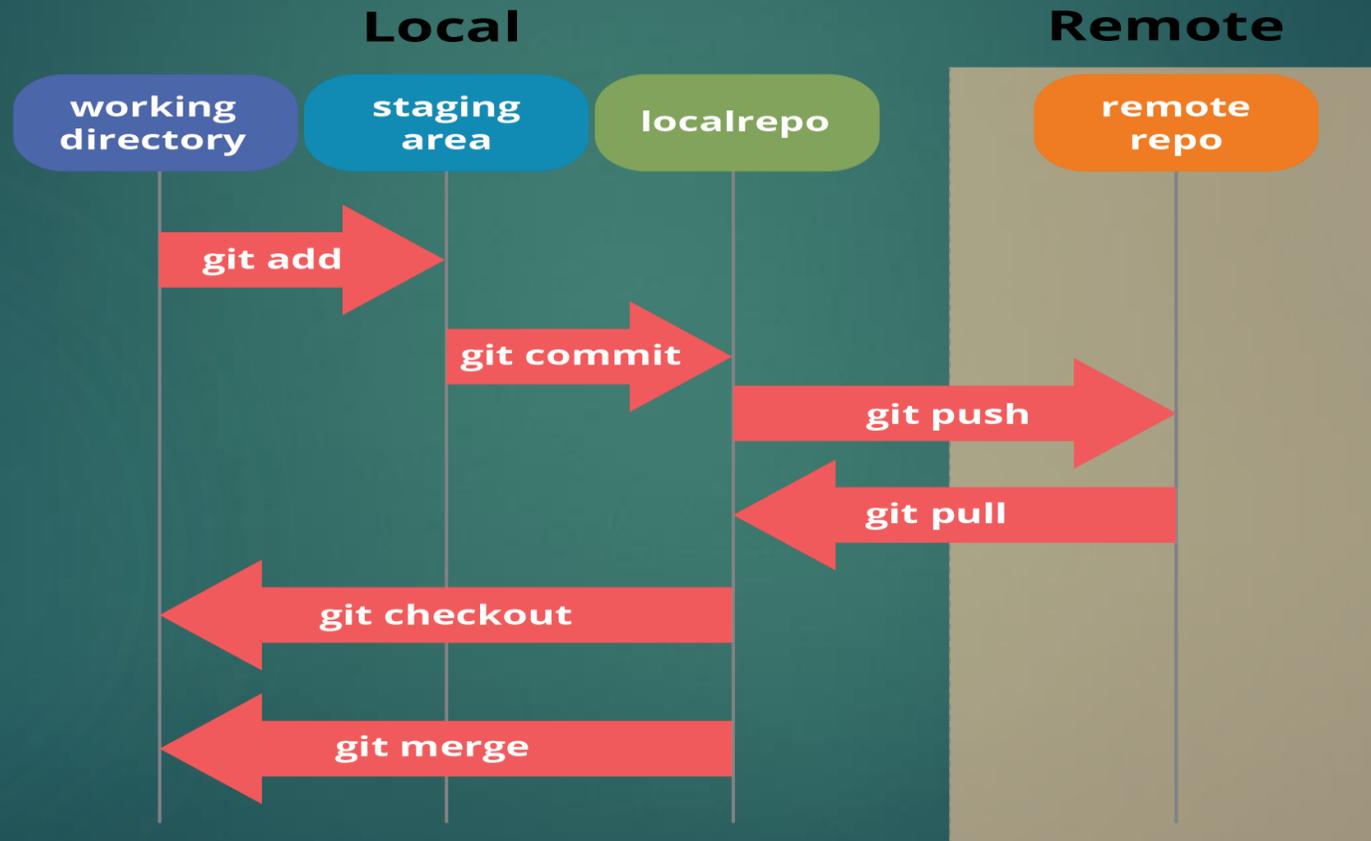
- api**  
Grants complete read/write access to the API, including all groups and projects, the container registry, and the package registry.
- read\_user**  
Grants read-only access to the authenticated user's profile through the /user API endpoint, which includes username, public email, and full name. Also grants access to read-only API endpoints under /users.
- read\_api**  
Grants read access to the API, including all groups and projects, the container registry, and the package registry.
- read\_repository**  
Grants read-only access to repositories on private projects using Git-over-HTTP or the Repository Files API.
- write\_repository**  
Grants read-write access to repositories on private projects using Git-over-HTTP (not using the API).
- read\_registry**  
Grants read-only access to container registry images on private projects.
- write\_registry**  
Write Registry

Create personal access token

#### Active Personal Access Tokens (1)

Name	Created	Expires	Scopes
------	---------	---------	--------

# How git works?



# How to use git?

- ▶ To download a git repo run
  - ▶ `git clone git@gitlab-csd.datacenter.uoc.gr:csdp1144/assignment1.git`
- ▶ To stage a file run
  - ▶ `git add file`
- ▶ To commit staged files run
  - ▶ `git commit -m "Your commit message"`
- ▶ To save your code in the server run
  - ▶ `git push`
- ▶ To turn in your code you have 2 options
  - ▶ `make turnin`
  - ▶ `git tag assignment1;git push origin -tags`
- ▶ To delete a previous tagged commit
  - ▶ `git tag -d assignment1`
  - ▶ `git push origin :refs/tags/assignment1`

# Guidelines

- ▶ commit often - at least one commit for each step
- ▶ pay attention to your commit messages
  - ▶ describe precisely the purpose of the commit
  - ▶ commit only relevant files and modifications... !!!
- ▶ push frequently
  - ▶ in case something goes wrong with your PC/laptop