



# HY-255

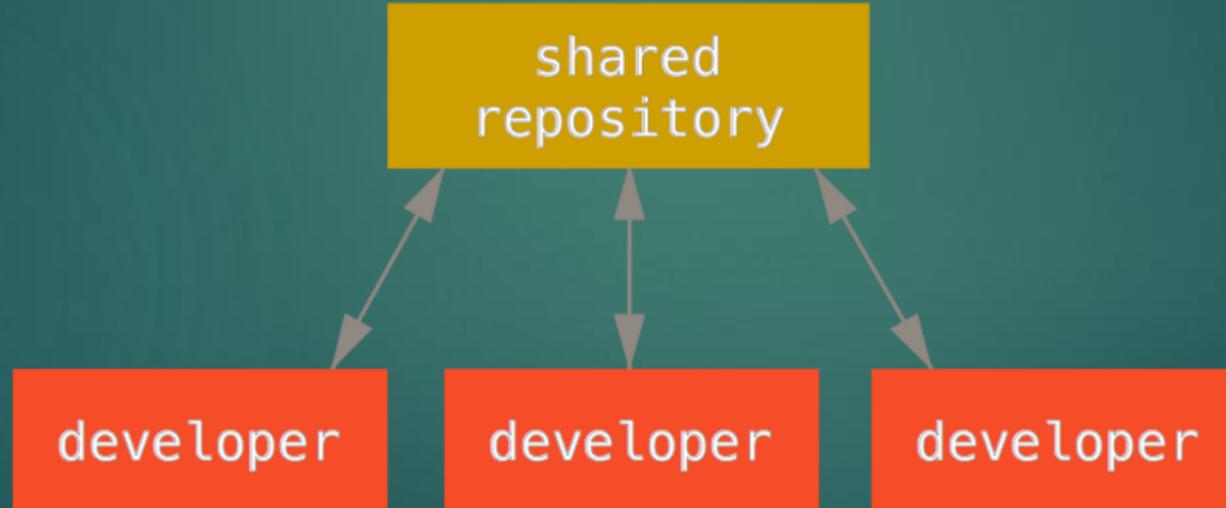
# Git Tutorial

# Outline

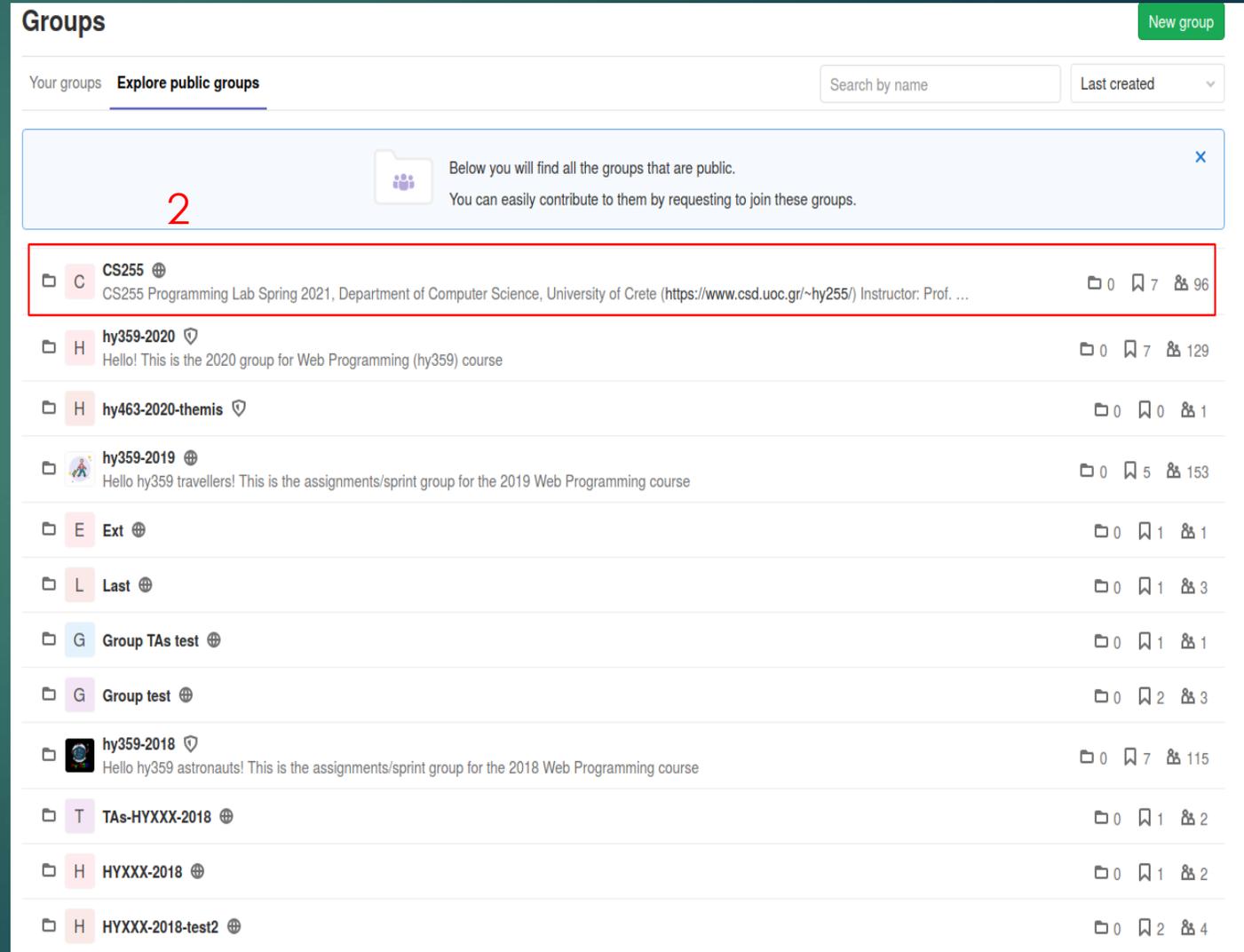
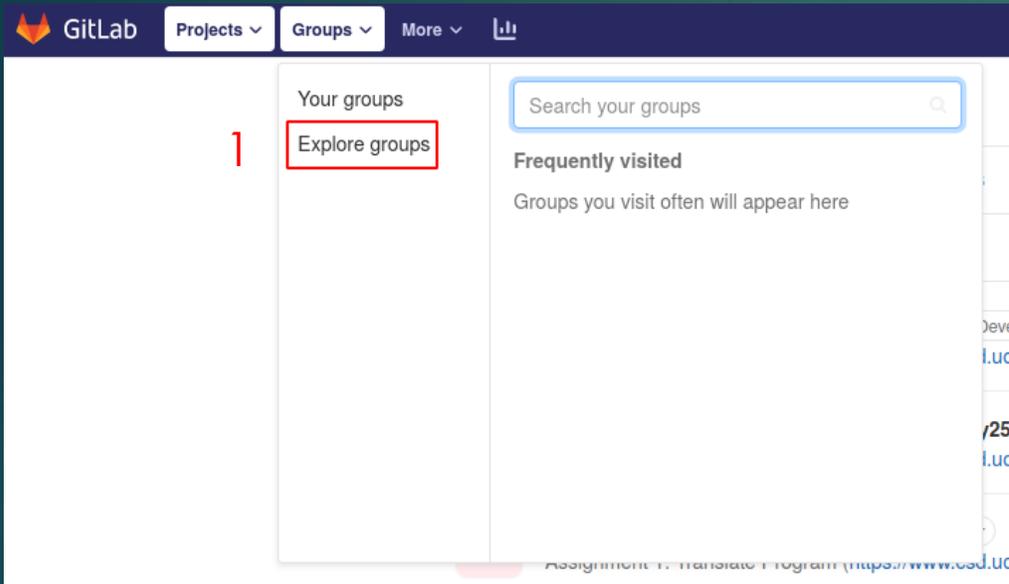
- ▶ What is git
- ▶ How to join HY-255 group
- ▶ What are ssh keys and how to use them
- ▶ How to fork a project
- ▶ Make project private and add TAs as members
- ▶ How to use private.py
- ▶ How to use git

# What is git?

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



# How to join HY-255 group



# 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|
```

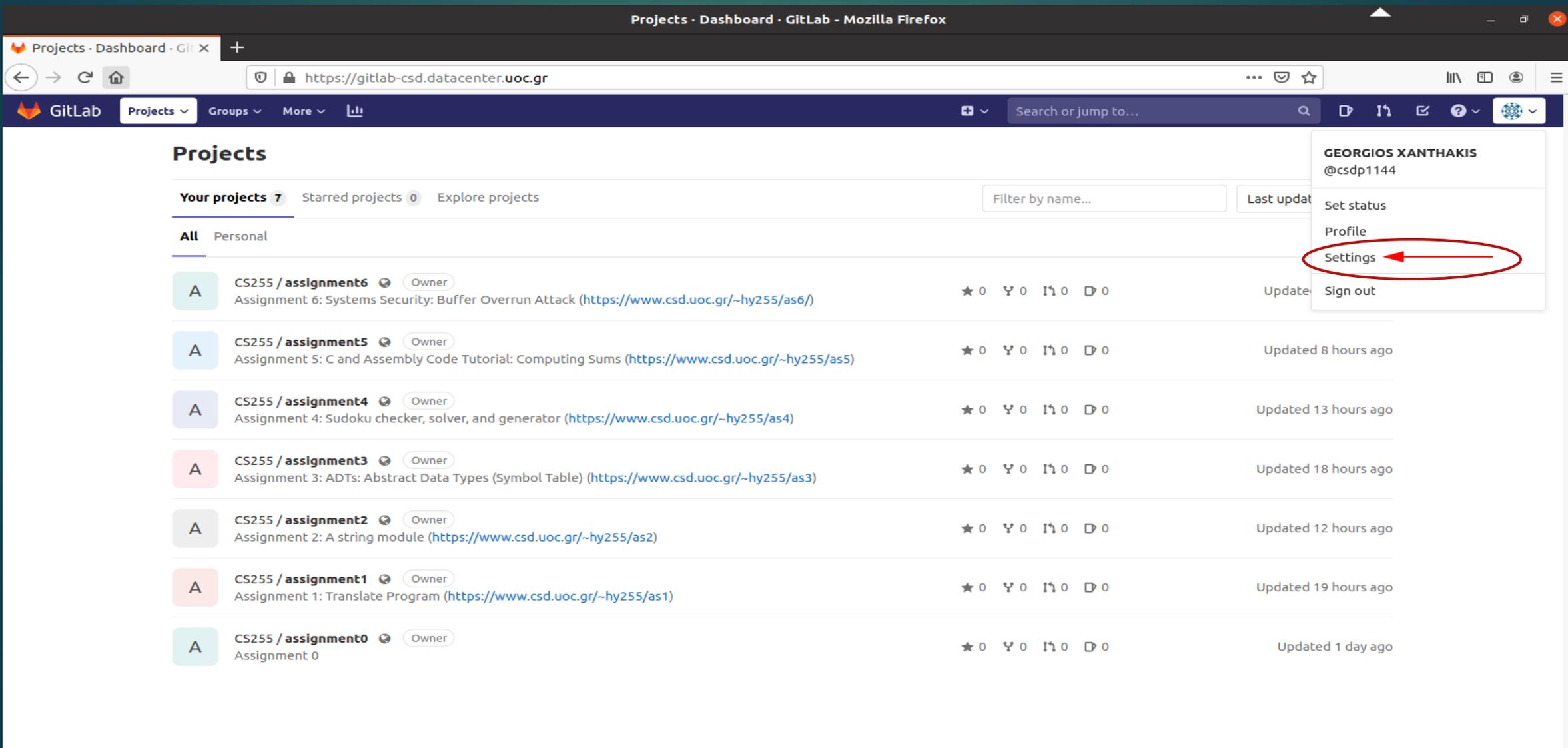
```
+-----[SHA256]-----+
```

```
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' section, 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 menu with the following items: Profile, Account, Applications, Chat, Access Tokens, Emails, Notifications, **SSH Keys** (highlighted with a red circle and arrow), GPG Keys, Preferences, Active Sessions, and Authentication log. The main content area is titled "User Settings > Edit Profile" and includes sections for: "Public Avatar" with an upload button and a note that the maximum file size is 200KB; "Current status" with a text input field containing "What's your status?"; "Main settings" with input fields for "Full name" (GEORGIOS XANTHAKIS) and "User ID" (404); "Email" with a field containing "csdp1144@csd.uoc.gr" and a note that it was automatically set from LDAP; "Public email" with a dropdown set to "Do not show on profile"; and "Commit email" with a field containing "csdp1144@csd.uoc.gr".

# Add ssh-keys in your account

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

The screenshot displays the GitLab User Settings page for SSH Keys. The left sidebar contains navigation options: Profile, Account, Applications, Chat, Access Tokens, Emails, Notifications, SSH Keys (highlighted), GPG Keys, Preferences, Active Sessions, and Authentication log. The main content area is titled 'SSH Keys' and includes a description: 'SSH keys allow you to establish a secure connection between your computer and GitLab.' Below this, there is a section 'Add an SSH key' with instructions: 'To add an SSH key you need to generate one or use an existing key.' A 'Key' section follows, stating: '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.' A text input field contains a public SSH key for 'ssh-rsa' and is highlighted with a red box and labeled '1'. Below the input field are two text boxes: 'Title' (containing 'gxanth@csd.uoc.gr') and 'Expires at' (containing 'mm / dd / yyyy'). A green 'Add key' button is highlighted with a red box and labeled '2'. At the bottom, a section titled 'Your SSH keys (0)' contains a message: 'There are no SSH keys with access to your account.'

# How to fork a repo

The screenshot shows the GitLab web interface for a repository named 'hy255\_as1'. The page layout includes a left sidebar with navigation options like 'Project overview', 'Details', 'Activity', 'Releases', 'Repository', 'Issues', 'Merge Requests', 'Packages', 'Analytics', 'Wiki', 'Snippets', and 'Settings'. The main content area displays the repository details, including the repository name, project ID (1734), and statistics (5 Commits, 1 Branch, 0 Tags, 307 KB Files, 307 KB Storage). A red arrow points to the 'Fork' button, which is located in the top right corner of the repository header. Below the repository header, there is a section for the latest commit, 'Update README.md', and a table of files and their commit history.

CS255 > hy255\_as1 > Details

hy255\_as1  
Project ID: 1734

5 Commits 1 Branch 0 Tags 307 KB Files 307 KB Storage

Assignment 1: Translate Program (<https://www.csd.uoc.gr/~hy255/as1>)

master assignment1 / +

History Find file Web IDE Clone

Update README.md  
Jack Kolokasis authored 3 days ago  
e09c9ea1

README Auto DevOps enabled Add LICENSE Add CHANGELOG Add CONTRIBUTING

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

README.md

Assignment1: Translate Program

# How to fork a repo

GitLab Projects Groups More

Search or jump to...

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 shows the GitLab web interface for a project named 'hy255\_as1'. The project is owned by 'GEORGIOS XANTHAKIS'. A notification at the top states: 'You won't be able to pull or push project code via SSH until you add an SSH key to your profile'. The project details show it was successfully forked, has 5 commits, 1 branch, 0 tags, 0 bytes of files, and 0 bytes of storage. The assignment is titled 'Assignment 1: Translate Program' with a link to <https://www.csd.uoc.gr/~hy255/as1>. A commit titled 'Update README.md' by Jack Kolokasis is shown. Below the commit are buttons for 'README', 'Auto DevOps enabled', 'Add LICENSE', 'Add CHANGELOG', and 'Add CONTRIBUTING'. A table with columns 'Name', 'Last commit', and 'Last update' is partially visible.

In the bottom foreground, a terminal window shows the command: `python3 private.py -t qKyZ5HM-Vxb63JFhFYJ6 -p 1781`. The access token 'qKyZ5HM-Vxb63JFhFYJ6' and the project ID '1781' are highlighted in red. Below the terminal, the labels 'Access Token' and 'Project ID' are written in red text.

# Generating an Access Token

The screenshot shows the GitLab web interface. At the top, there is a navigation bar with the GitLab logo, 'Projects', 'Groups', and 'More' dropdown menus, along with a search bar and utility icons. The main content area is titled 'Projects' and features a 'New project' button. Below this, there are filters for 'Your projects 24', 'Starred projects 0', and 'Explore projects'. A search box labeled 'Filter by name...' and a 'Last updated' dropdown are also present. The project list includes columns for project name, repository status, role, and update time. On the right side, a user profile sidebar for 'GEORGIOS XANTHAKIS @csdp1144' is visible, with options for 'Set status', 'Profile', 'Settings', and 'Sign out'. The 'Settings' option is highlighted with a white circle and a red arrow.

Avatar	Project Name	Role	Stars	Forks	Issues	Discussions	Last Updated
H	EVANGELOS YFANTIS / hy255_as1	Developer	0	0	0	0	Updated 3 hours ago
H	ALEXANDROS EMMANOUIL ANTONAKAKIS / hy255_as1	Developer	0	0	0	0	Updated 3 hours ago
H	ELEFThERIOS NTAFOtIS KONTOGIANNIS / hy255_as1	Developer	0	0	0	0	Updated 3 hours ago
H	IASON FILIPPOS NTAGIANNIS / hy255_as1	Developer	0	0	0	0	Updated 7 hours ago
H	CHRISTINA REPOU / hy255_as1	Developer	0	0	0	0	Updated 8 hours ago
H	ALEXANDROS GKEKAS / hy255_as1	Developer	0	0	0	0	Updated 10 hours ago
H	EMMANOUIL FILIPPAKIS / hy255_as1	Developer	0	0	0	0	Updated 23 hours ago
H	THEODORA SABALOU / hy255_as1	Developer	0	0	0	0	Updated 1 day ago
H	ALEXANDROS PAPADOPOULOS / hy255_as1	Developer	0	0	0	0	Updated 1 day ago
H	AUREL SHEHAJ / hy255_as1	Developer	0	0	0	0	Updated 1 day ago

GEORGIOS XANTHAKIS  
@csdp1144

- Set status
- Profile
- Settings
- Sign out

# Generating an Access Token

GitLab Projects Groups More

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

Access Tokens

Collapse sidebar

# 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 red arrow points to a green button labeled 'Create personal access token', which is marked with the number '3'. Underneath, the 'Active Personal Access Tokens (0)' section shows a message: 'This user has no active Personal Access Tokens.' At the bottom, the 'Feed token' section displays the token 'ZcWEsCXZG-sd1zFkCywt' and a warning to keep it secret.

# 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**

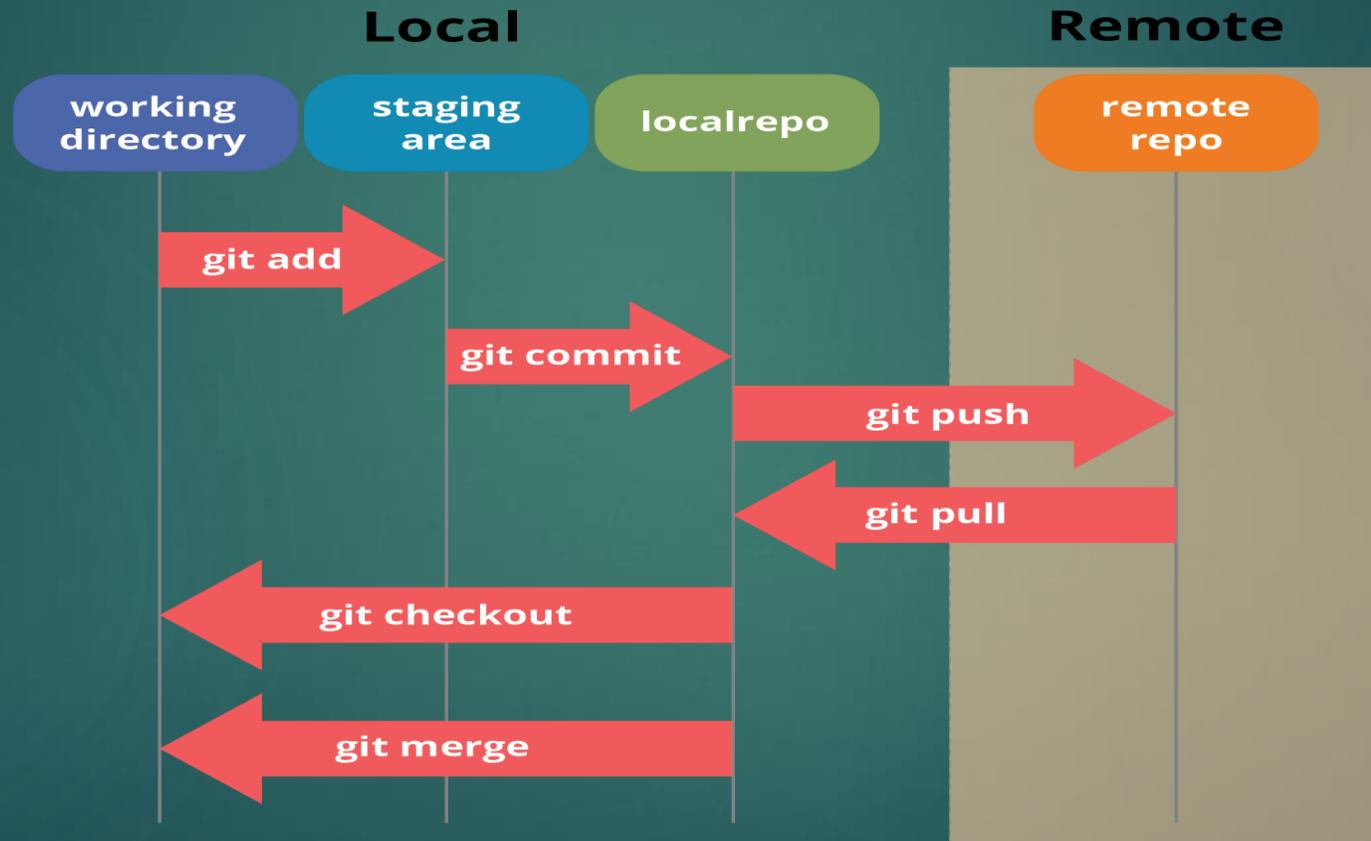
- api**  
Grants complete read/write access to the API, including all groups and projects, the container registry, and the package registry.
- read\_user**  
Grants read-only access to the authenticated user's profile through the /user API endpoint, which includes username, public email, and full name. 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