

DGIN 5201
Digital Transformation
Lecture 10

Source Version Control

Vlado Keselj

Time and date:
10:05–11:25, 12-Feb-2026
Location: McCain 2170

Image: DALL-E. Bing Image Creator. Generated by AI

Previous Lecture

- Review of e2 form
 - ▶ touch typing
 - ▶ text editors, emacs
- Web server Apache
- Available material (e3)
- Concepts and tools
 - ▶ Iterative prototyping and rsync
 - ▶ Apache options
- Password protection (e4)
- Unix-style customization
 - ▶ .htaccess, .htpasswd, .bashrc, .emacs

Announcements: Assignment 2

- A2 part 1: by tomorrow (Fri 13-Feb-2026) 11:59pm
 - ▶ A2 part 1: e1 and e2 on timberlea
- A2 part 2: by Fri 27-Feb-2026
 - ▶ A2 part 2: what we finish this week, will be specified
- A2 part 3: by Fri 6-Mar-2026
 - ▶ A2 part 3: to be completed after reading week
 - ▶ will be specified

Heads-up: Second Half of the Term

- 1 lab and 1 lecture to finish CS part from 1st half
- Seminars and project meetings
- Team meetings with instructors
 - ▶ 20 min formative meetings
 - ▶ check schedule on Brightspace Week 7 to 12

Source Version Control

- Before continuing with e5 etc. let us see how to submit e1, e2, e3, e4 to GitLab
- We will use this as an introduction to git, GitLab, GitHub
- git is a Source Version Control tool
- We already have used making several incremental copies of the code
 - ▶ or may use saving a file version as a backup for later
 - ▶ saving relatively often, not to lose code accidentally

What is GitLab?

- It is based on Git, a source version control system
- A source version control system is used
 - ▶ to store and manage different versions of code
 - ▶ to provide collaborative platform for software developers
- GitLab is based on Git and provides a web interface
- Similar to GitHub in this sense
- Provides Continuous Integration (CI) and Continuous Delivery (CD) of code
- A lot of material on Git and GitLab can be found on the Web

Step 1. Logging into DalFCS GitLab Website

- Open your Web browser and go to:
`https://git.cs.dal.ca`

DalFCS Git

Git repos for individual and group use.

Login using your [CSID](#) username & password. You can also check/update your login credentials and check if your account has become locked (i.e. due to repeated password errors) at the [CSID](#) page.

Contact the [DalFCS Helpdesk](#) at cshelp@cs.dal.ca for support requests, questions, etc.

If necessary, visit [Email Reconfirm](#) page to confirm your email address.

CSID Standard

Username

Password

 
 Remember me

Sign in

Step 2. Find your CSID Course Project in DGIN5201 Group

- The next step is to find your course project
- It is in the course group for the current term
- Its name is your CSID
- The next slide shows how the page with your projects approximately looks like

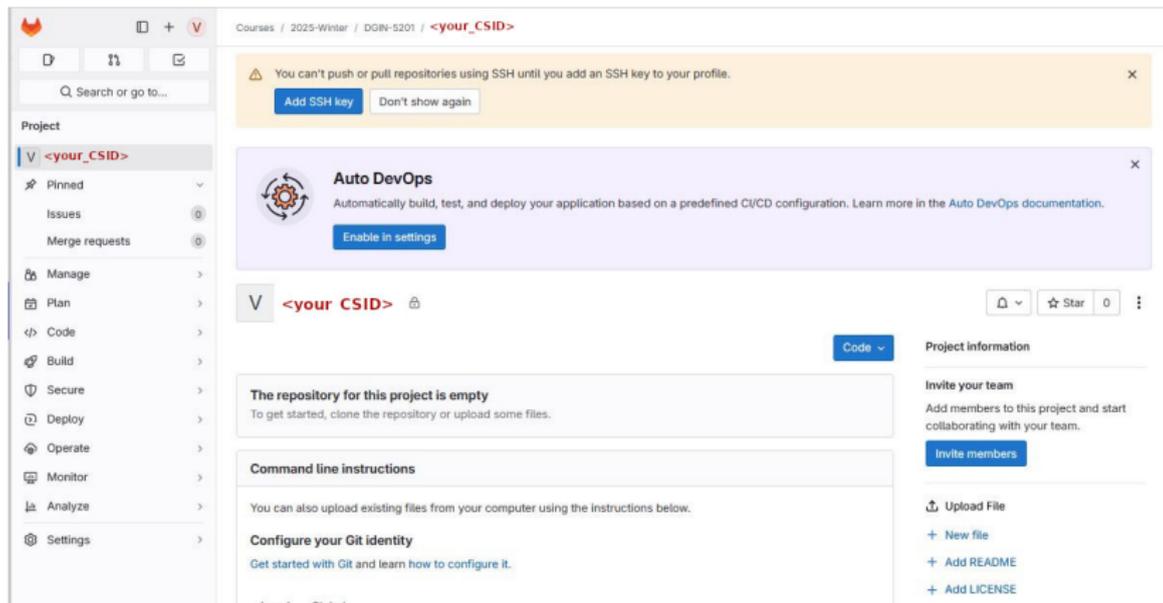
Approximate Page with Your Projects

- an approximate look of the page with your projects

The screenshot displays a web application interface. On the left is a sidebar with a navigation menu under the heading "Your work". The menu items are: Projects (selected), Groups, Issues, Merge requests, To-Do List, Milestones, Snippets, Activity, Workspaces, Environments, Operations, and Security. The main content area is titled "Your work > Projects". Below the title, there are filters: "Yours 1", "Starred 0", and "Pending deletion". A "Filter by name" input field is on the right. Below the filters, there are two tabs: "All" (selected) and "Personal". A single project is listed with a red square icon, the path "Courses / 2024-Winter / dgin5201 / <your CSID>", and a "Maintainer" role indicator. A tooltip with the text "<your CSID>" is visible over the path.

Your Course GitLab Project (Repository)

- It is named as your CSID and in the course group (2026-winter/dgin-5201/<your_csid>)
- URL: `https://git.cs.dal.ca/courses/2026-winter/dgin-5201/<your_csid>`

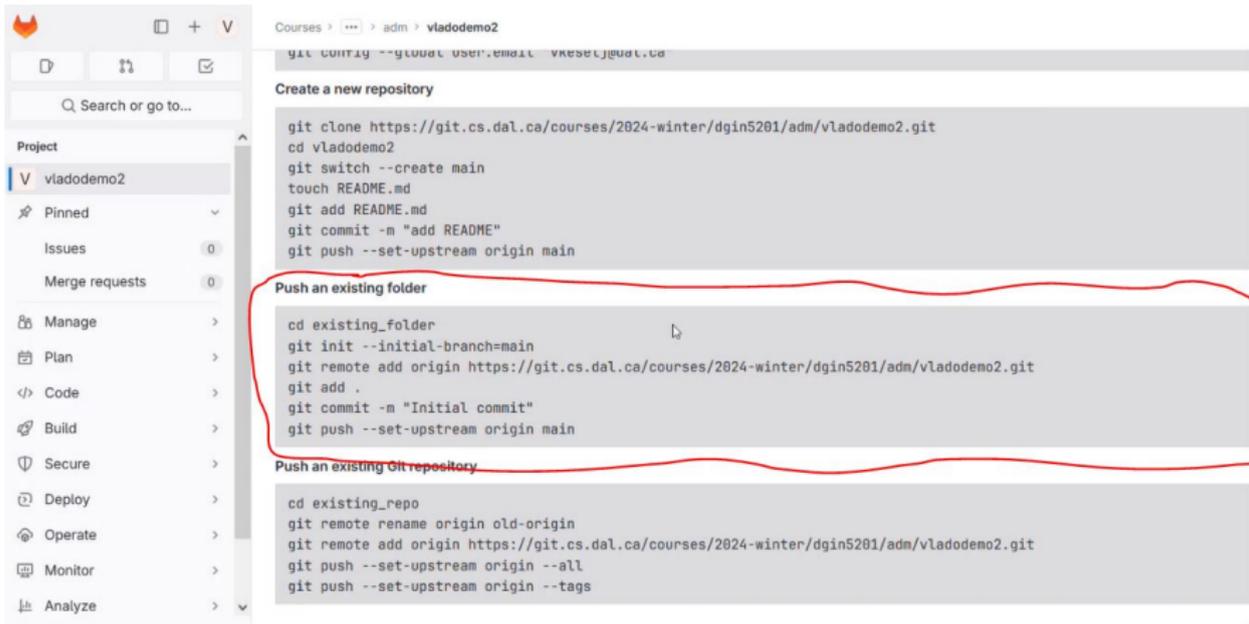


The screenshot shows the GitLab interface for a repository. The breadcrumb navigation at the top reads "Courses / 2025-Winter / DGIN-5201 / <your_csid>". A yellow warning banner at the top states: "You can't push or pull repositories using SSH until you add an SSH key to your profile." with buttons for "Add SSH key" and "Don't show again". Below this is an "Auto DevOps" section with a gear icon and text: "Automatically build, test, and deploy your application based on a predefined CI/CD configuration. Learn more in the Auto DevOps documentation." with an "Enable in settings" button. The repository name is displayed as "<your CSID>". A blue "Code" button is visible. The main content area contains the message: "The repository for this project is empty. To get started, clone the repository or upload some files." Below this are sections for "Command line instructions" (with the text "You can also upload existing files from your computer using the instructions below.") and "Configure your Git identity" (with the text "Get started with Git and learn how to configure it."). On the right side, there is a "Project information" section with an "Invite your team" sub-section containing the text "Add members to this project and start collaborating with your team." and an "Invite members" button. Below that is an "Upload File" section with options for "+ New file", "+ Add README", and "+ Add LICENSE". The left sidebar shows navigation options: Project, Pinned, Issues, Merge requests, Manage, Plan, Code, Build, Secure, Deploy, Operate, Monitor, Analyze, and Settings.

Step 3: Uploading your Files from timberlea

- In this step you should upload your lab files from timberlea into the GitLab server
- The instructions are shown in the GitLab page
- You should also open another command-line window for ssh login to timberlea
- **Note:** The following slides will have some incorrect information based on previous years. I will point out differences and correct them after class.

Instructions to Upload our Files



Courses > ... > adm > vladodemo2

```
git config --global user.email vkeselj@dal.ca
```

Create a new repository

```
git clone https://git.cs.dal.ca/courses/2024-winter/dgin5201/adm/vladodemo2.git
cd vladodemo2
git switch --create main
touch README.md
git add README.md
git commit -m "add README"
git push --set-upstream origin main
```

Push an existing folder

```
cd existing_folder
git init --initial-branch=main
git remote add origin https://git.cs.dal.ca/courses/2024-winter/dgin5201/adm/vladodemo2.git
git add .
git commit -m "Initial commit"
git push --set-upstream origin main
```

Push an existing Git repository

```
cd existing_repo
git remote rename origin old-origin
git remote add origin https://git.cs.dal.ca/courses/2024-winter/dgin5201/adm/vladodemo2.git
git push --set-upstream origin --all
git push --set-upstream origin --tags
```

Login to timberlea Server

- In another window, we login to timberlea server
- It will probably be a command-line window or terminal window in which we type the command:

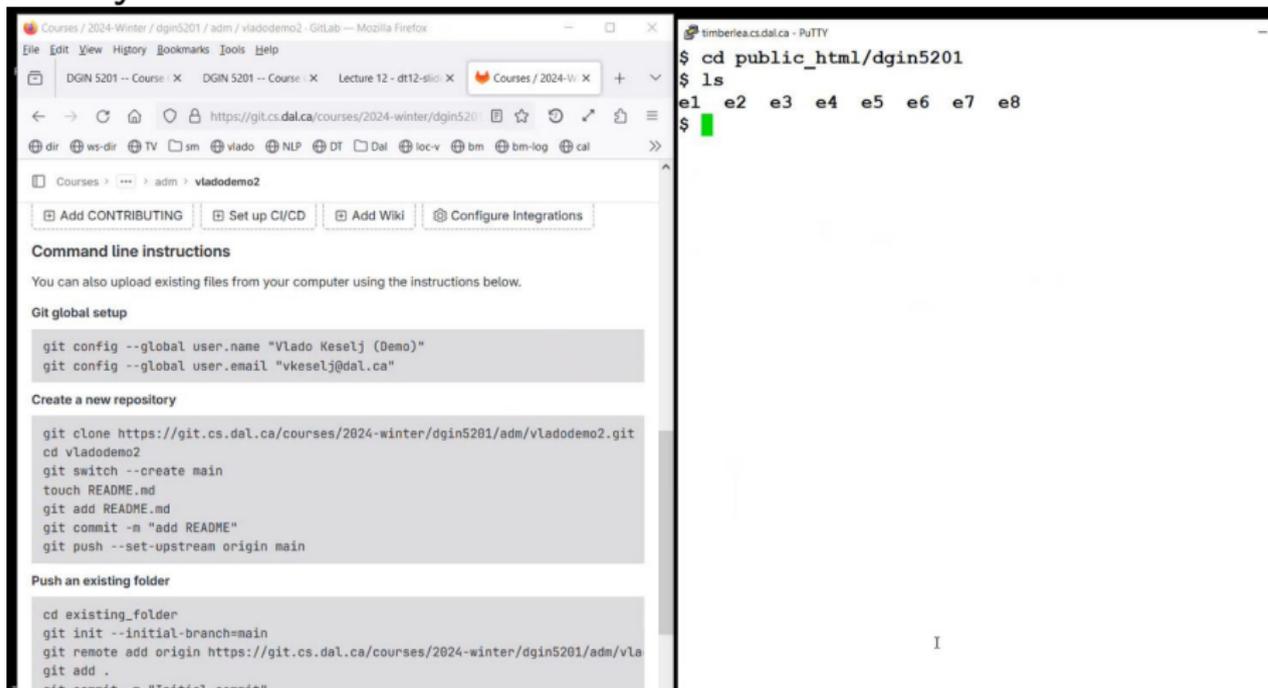
```
ssh <your_csid>@timberlea.cs.dal.ca
```

where instead of `<your_csid>` you should use your own CSID

- or maybe you can use PuTTY, mobaxterm, or other SSH application
- You should try to have two windows: the web browser with GitLab, and the command-line window

Going to your Labs Directory

- Change directory to `public_html/dgin5201` and list contents
- your screen with two windows could look as follows:



Create Directory `git`

- make directory `git`
- make sure that the directory has permissions `rxw` for for the user only (`rxw-----`)
- the next screenshot shows how it would look on my screen

```
$ ls
e1 e2 e3 e4 e5 e6 e7 e8
$ mkdir git
$ ls -ltra
total 8
drwx--x--x  2 vladodemo csfac   43 Feb  6 13:16 e1
drwx--x--x  3 vladodemo csfac   59 Feb  6 13:27 e2
drwx--x--x  3 vladodemo csfac   22 Feb  8 08:49 ..
drwx--x--x  3 vladodemo csfac  121 Feb  8 13:59 e3
drwx--x--x  3 vladodemo csfac  121 Feb  8 13:59 e4
drwx--x--x  3 vladodemo csfac  178 Feb  8 15:26 e5
drwx--x--x  3 vladodemo csfac  209 Feb  8 15:39 e6
drwx--x--x  3 vladodemo csfac  209 Feb 13 14:56 e7
drwx--x--x  3 vladodemo csfac 4096 Feb 13 15:34 e8
drwx--x--x  2 vladodemo csfac    6 Feb 15 14:57 git
drwx--x--x 13 vladodemo csfac  120 Feb 15 14:57 .
$ █
```

Copy directories e1...e4 into directory git

- We first rsync directory e1:

```
timberlea.cs.dal.ca - PuTTY
$ ls
e1 e2 e3 e4 e5 e6 e7 e8
$ mkdir git
$ ls -ltra
total 8
drwx--x--x  2 vladodemo csfac   43 Feb  6 13:16 e1
drwx--x--x  3 vladodemo csfac   59 Feb  6 13:27 e2
drwx--x--x  3 vladodemo csfac   22 Feb  8 08:49 ..
drwx--x--x  3 vladodemo csfac  121 Feb  8 13:59 e3
drwx--x--x  3 vladodemo csfac  121 Feb  8 13:59 e4
drwx--x--x  3 vladodemo csfac  178 Feb  8 15:26 e5
drwx--x--x  3 vladodemo csfac  209 Feb  8 15:39 e6
drwx--x--x  3 vladodemo csfac  209 Feb 13 14:56 e7
drwx--x--x  3 vladodemo csfac 4096 Feb 13 15:34 e8
drwx-----  2 vladodemo csfac    6 Feb 15 14:57 git
drwx--x--x 13 vladodemo csfac  120 Feb 15 14:57 .
$ rsync -av e1/ git/e1/
```

Copy other Directories with rsync: e2

```
$ rsync -av e2/ git/e2/  
sending incremental file list  
created directory git/e2  
./  
index.html
```

I

```
timberlea.cs.dal.ca - PuTTY
index.html~

sent 255 bytes  received 86 bytes  682.00 bytes/sec
total size is 70  speedup is 0.21
$ rsync -av e2/ git/e2/
sending incremental file list
created directory git/e2
./
index.html
index.html~
material/
material/.htaccess
material/MDI-page.pdf

sent 794,495 bytes  received 136 bytes  1,589,262.00 bytes/
sec
total size is 793,957  speedup is 1.00
$ rsync -av e3/ git/e3/
sending incremental file list
created directory git/e3
./
.htaccess
.htaccess~
.htpasswd
index.html
index.html~
pw
material/
material/.htaccess
material/MDI-page.pdf
```

```
$ rsync -av e4/ git/e4/
```

Use highlighted commands to check your git directory

```
$ ls
e1 e2 e3 e4 e5 e6 e7 e8 git
$ cd git
$ ls
e1 e2 e3 e4 e5 e6 e7 e8
$ ls -l
total 4
drwx--x--x 2 vladodemo csfac 43 Feb 6 13:16 e1
drwx--x--x 3 vladodemo csfac 59 Feb 6 13:27 e2
drwx--x--x 3 vladodemo csfac 121 Feb 8 13:59 e3
drwx--x--x 3 vladodemo csfac 121 Feb 8 13:59 e4
drwx--x--x 3 vladodemo csfac 178 Feb 8 15:26 e5
drwx--x--x 3 vladodemo csfac 209 Feb 8 15:39 e6
drwx--x--x 3 vladodemo csfac 209 Feb 13 14:56 e7
drwx--x--x 3 vladodemo csfac 4096 Feb 13 15:34 e8
$ pwd
<your home directory .....> /public_html/dgin5201/git
```

Follow git Commands for Upload

We now follow git commands shows on the GitLab page
First, let us highlight which ones we will use:

```
git clone https://git.cs.dal.ca/courses/2024-winter/dgin5201/adm/vladodemo2.git
cd vladodemo2
git switch --create main
touch README.md
git add README.md
git commit -m "add README"
git push --set-upstream origin main

Push an existing folder
cd existing_folder
git init --initial-branch=main
git remote add origin https://git.cs.dal.ca/courses/2024-winter/dgin5201/adm/vla
git add .
git commit -m "Initial commit"
git push --set-upstream origin main

Push an existing Git repository
cd existing_repo
git remote rename origin old-origin
git remote add origin https://git.cs.dal.ca/courses/2024-winter/dgin5201/adm/vla
git push --set-upstream origin --all
git push --set-upstream origin --tags

test.cgi
material/
material/.htaccess
material/MDI-page.pdf

sent 806,456 bytes  received 478 bytes  322,773.60 bytes/se
c
total size is 804,714  speedup is 1.00
$ ls
e1 e2 e3 e4 e5 e6 e7 e8 e8a git save
$ cd git
$ ls
e1 e2 e3 e4 e5 e6 e7 e8
$ ls -l
total 4
drwx--x--x 2 vladodemo csfac  43 Feb  6 13:16 e1
drwx--x--x 3 vladodemo csfac  59 Feb  6 13:27 e2
drwx--x--x 3 vladodemo csfac 121 Feb  8 13:59 e3
drwx--x--x 3 vladodemo csfac 121 Feb  8 13:59 e4
drwx--x--x 3 vladodemo csfac 178 Feb  8 15:26 e5
drwx--x--x 3 vladodemo csfac 209 Feb  8 15:39 e6
drwx--x--x 3 vladodemo csfac 209 Feb 13 14:56 e7
drwx--x--x 3 vladodemo csfac 4096 Feb 13 15:34 e8
$ pwd
/users/faculty/vladodemo/public_html/dgin5201/git
```

Type in Commands as Shown in GitLab page

Carefully copy commands from the GitLab page (these screenshots are from the last year):

Push an existing folder

```
cd existing_folder
git init --initial-branch=main
git remote add origin https://git.cs.dal.ca/courses/2024-winter/dgin5201/adm/vla
git add .
git commit -m "Initial commit"
git push --set-upstream origin main
```

Push an existing Git repository

```
cd existing_repo
git remote rename origin old-origin
git remote add origin https://git.cs.dal.ca/courses/2024-winter/dgin5201/adm/vla
git push --set-upstream origin --all
git push --set-upstream origin --tags
```

```
$ ls -l
total 4
drwx--x--x 2 vladodemo csfac 43 Feb 6 13:16 e1
drwx--x--x 3 vladodemo csfac 59 Feb 6 13:27 e2
drwx--x--x 3 vladodemo csfac 121 Feb 8 13:59 e3
drwx--x--x 3 vladodemo csfac 121 Feb 8 13:59 e4
drwx--x--x 3 vladodemo csfac 178 Feb 8 15:26 e5
drwx--x--x 3 vladodemo csfac 209 Feb 8 15:39 e6
drwx--x--x 3 vladodemo csfac 209 Feb 13 14:56 e7
drwx--x--x 3 vladodemo csfac 4096 Feb 13 15:34 e8
$ pwd
/users/faculty/vladodemo/public_html/dgin5201/git
$ git init --initial-branch=main
Initialized empty Git repository in /users/webhome/vladodem
o/dgin5201/git/.git/
$ git remote add origin https://git.cs.dal.ca/courses/2024-
winter/dgin5201/yourssid
```

Push an existing folder

```
git_folder
--initial-branch=main
> add origin https://git.cs.dal.ca/courses/2024-winter/dgin5201/adm/vladodemo2.git

t -n "Initial commit"
--set-upstream origin main
```

Push an existing Git repository

```
cd existing_repo
git remote rename origin old-origin
git remote add origin https://git.cs.dal.ca/courses/2024-winter/dgin5201/adm/vla
git push --set-upstream origin --all
git push --set-upstream origin --tags
```

```
$ ls -l
```

```
total 4
```

```
drwx--x--x 2 vladodemo csfac 43 Feb 6 13:16 e1
drwx--x--x 3 vladodemo csfac 59 Feb 6 13:27 e2
drwx--x--x 3 vladodemo csfac 121 Feb 8 13:59 e3
drwx--x--x 3 vladodemo csfac 121 Feb 8 13:59 e4
drwx--x--x 3 vladodemo csfac 178 Feb 8 15:26 e5
drwx--x--x 3 vladodemo csfac 209 Feb 8 15:39 e6
drwx--x--x 3 vladodemo csfac 209 Feb 13 14:56 e7
drwx--x--x 3 vladodemo csfac 4096 Feb 13 15:34 e8
```

```
$ pwd
```

```
/users/faculty/vladodemo/public_html/dgin5201/git
```

```
$ git init --initial-branch=main
```

```
Initialized empty Git repository in /users/webhome/vladodem
o/dgin5201/git/.git/
```

```
$ git remote add origin https://git.cs.dal.ca/courses/2024-
winter/dgin5201/yourcsid.git
```

Push an existing folder

```
cd existing_folder
git init --initial-branch=main
git remote add origin https://git.cs.dal.ca/courses/2024-winter/dgin5201/adm/vla
git add .
git commit -m "Initial commit"
git push --set-upstream origin main
```

Push an existing Git repository

```
cd existing_repo
git remote rename origin old-origin
git remote add origin https://git.cs.dal.ca/courses/2024-winter/dgin5201/adm/vla
git push --set-upstream origin --all
git push --set-upstream origin --tags
```

```
drwx--x--x 3 vladodemo csfac 59 Feb 6 13:27 ez
drwx--x--x 3 vladodemo csfac 121 Feb 8 13:59 e3
drwx--x--x 3 vladodemo csfac 121 Feb 8 13:59 e4
drwx--x--x 3 vladodemo csfac 178 Feb 8 15:26 e5
drwx--x--x 3 vladodemo csfac 209 Feb 8 15:39 e6
drwx--x--x 3 vladodemo csfac 209 Feb 13 14:56 e7
drwx--x--x 3 vladodemo csfac 4096 Feb 13 15:34 e8
$ pwd
/users/faculty/vladodemo/public_html/dgin5201/git
$ git init --initial-branch=main
Initialized empty Git repository in /users/webhome/vladodem
o/dgin5201/git/.git/
$ git remote add origin https://git.cs.dal.ca/courses/2024-
winter/dgin5201/adm/vladodemo2.git
$ git add .
$ git commit -m "Initial commit"
```

```
Courses > ... > adm > vladodemo2

git clone https://git.cs.dal.ca/courses/2024-winter/dgin5201/adm/vladodemo2.git
cd vladodemo2
git switch --create main
touch README.md
git add README.md
git commit -m "add README"
git push --set-upstream origin main

Push an existing folder

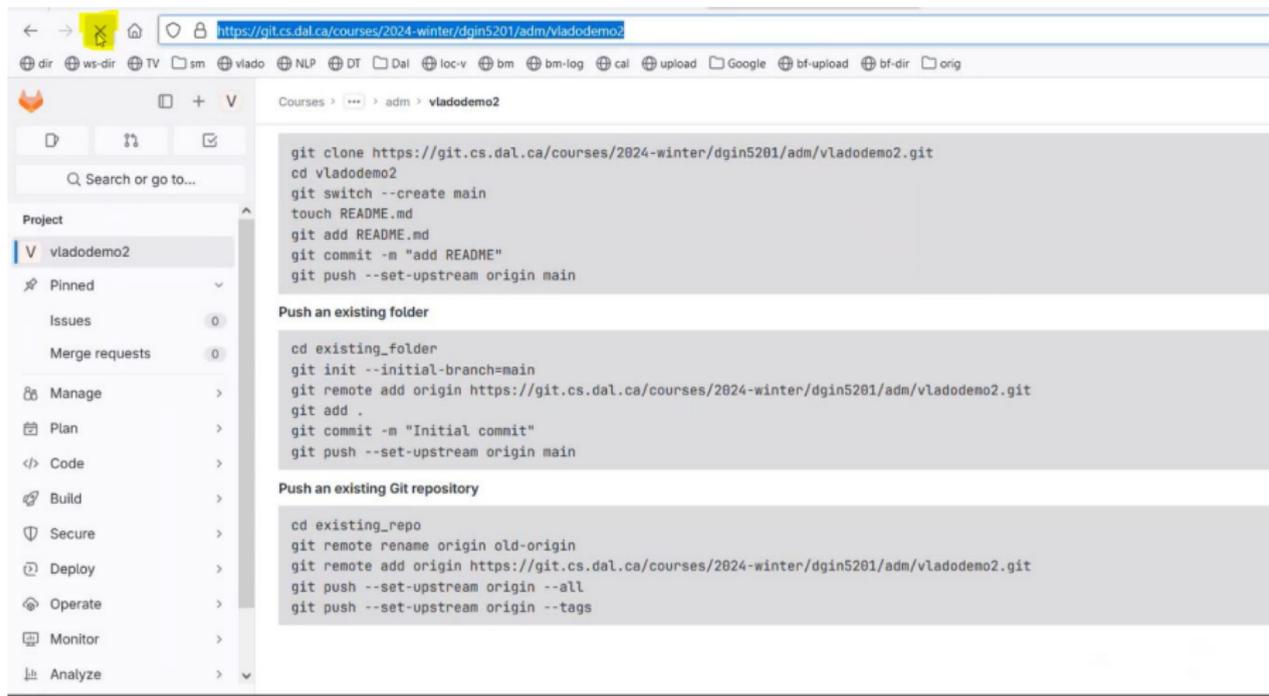
cd existing_folder
git init --initial-branch=main
git remote add origin https://git.cs.dal.ca/courses/2024-winter/dgin5201/adm/vla
git add .
git commit -m "Initial commit"
git push --set-upstream origin main

Push an existing Git repository

cd existing_repo
git remote rename origin old-origin
git remote add origin https://git.cs.dal.ca/courses/2024-winter/dgin5201/adm/vla
git push --set-upstream origin --all
git push --set-upstream origin --tags
```

```
create mode 100644 e8/material/MDI-page.pdf
create mode 100644 e8/pw
create mode 100755 e8/register-py.cgi
create mode 100755 e8/register-py.cgi~
create mode 100755 e8/register.cgi
create mode 100755 e8/register.cgi~
create mode 100755 e8/register.php
create mode 100755 e8/register.py
create mode 100644 e8/registrations-saved.txt
create mode 100755 e8/test.cgi
$ git push --set-upstream origin main
Username for 'https://git.cs.dal.ca': vladodemo
Password for 'https://vladodemo@git.cs.dal.ca':
Enumerating objects: 44, done.
Counting objects: 100% (44/44), done.
Delta compression using up to 32 threads
Compressing objects: 100% (40/40), done.
Writing objects: 100% (44/44), 766.54 KiB | 12.78 MiB/s, do
ne.
Total 44 (delta 21), reused 0 (delta 0), pack-reused 0
To https://git.cs.dal.ca/courses/2024-winter/dgin5201/adm/v
ladodemo2.git
 * [new branch]      main -> main
Branch 'main' set up to track remote branch 'main' from 'or
igin'.
$
```

Refresh GitLab Page to Check Contents



The screenshot shows a web browser window displaying a GitLab repository page. The URL in the address bar is `https://git.cs.dal.ca/courses/2024-winter/dgin5201/adm/vladodemo2`. The page title is "Courses > ... > adm > vladodemo2".

The left sidebar shows the project navigation menu with the following items:

- Project
- V vladodemo2
- Pinned
- Issues (0)
- Merge requests (0)
- Manage
- Plan
- Code
- Build
- Secure
- Deploy
- Operate
- Monitor
- Analyze

The main content area displays three sections of terminal instructions:

```
git clone https://git.cs.dal.ca/courses/2024-winter/dgin5201/adm/vladodemo2.git
cd vladodemo2
git switch --create main
touch README.md
git add README.md
git commit -m "add README"
git push --set-upstream origin main
```

Push an existing folder

```
cd existing_folder
git init --initial-branch=main
git remote add origin https://git.cs.dal.ca/courses/2024-winter/dgin5201/adm/vladodemo2.git
git add .
git commit -m "Initial commit"
git push --set-upstream origin main
```

Push an existing Git repository

```
cd existing_repo
git remote rename origin old-origin
git remote add origin https://git.cs.dal.ca/courses/2024-winter/dgin5201/adm/vladodemo2.git
git push --set-upstream origin --all
git push --set-upstream origin --tags
```

Expected Contents in your GitLab Repository

The screenshot shows a web browser displaying the GitLab interface for a repository named 'vladodemo2'. The browser's address bar shows the URL: `https://git.cs.dal.ca/courses/2024-winter/dgin5201/adm/vladodemo2`. The repository page features a navigation sidebar on the left with options like 'Pinned', 'Issues', 'Merge requests', 'Manage', 'Plan', 'Code', 'Build', 'Secure', 'Deploy', 'Operate', 'Monitor', and 'Analyze'. The main content area displays an 'Initial commit' by 'Vlado Keselj (Demo)' from 1 minute ago, with commit ID 'db48df63'. Below the commit information, there are buttons for 'Add README', 'Add LICENSE', 'Add CHANGELOG', 'Add CONTRIBUTING', 'Add Kubernetes cluster', 'Set up CI/CD', and 'Add Wiki'. A table lists the repository's contents:

Name	Last commit	Last update
📁 e1	Initial commit	1 minute ago
📁 e2	Initial commit	1 minute ago
📁 e3	Initial commit	1 minute ago
📁 e4	Initial commit	1 minute ago
📁 e5	Initial commit	1 minute ago
📁 e6	Initial commit	1 minute ago
📁 e7	Initial commit	1 minute ago

Browser address bar: <https://git.cs.dal.ca/courses/2024-winter/dgjn5201/adm/vladodemo2>

Project: vladodemo2

main vladodemo2 / +

History Find file Edit Clone

Add README Add LICENSE Add CHANGELOG Add CONTRIBUTING Add Kubernetes cluster Set up CI/CD Add Wiki

Configure Integrations

Name	Last commit	Last update
e1	Initial commit	1 minute ago
e2	Initial commit	1 minute ago
e3	Initial commit	1 minute ago
e4	Initial commit	1 minute ago
e5	Initial commit	1 minute ago
e6	Initial commit	1 minute ago
e7	Initial commit	1 minute ago
e8	Initial commit	1 minute ago

Project sidebar: Pinned, Issues (0), Merge requests (0), Manage, Plan, Code, Build, Secure, Deploy, Operate, Monitor, Analyze


+ V





Search or go to...

Project

vladodemo2

- Pinned
- Issues 0
- Merge requests 0
- Manage
- Plan
- Code
- Build
- Secure
- Deploy
- Operate
- Monitor
- Analyze

Courses > ... > adm > vladodemo2

main vladodemo2 / e8 / +

Lock History Find file Edit ↓ ↓ Clone ↓

Name	Last commit	Last update
..		
material	Initial commit	1 minute ago
.htaccess	Initial commit	1 minute ago
.htaccess~	Initial commit	1 minute ago
.htpasswd	Initial commit	1 minute ago
index-php.html	Initial commit	1 minute ago
index-php.html~	Initial commit	1 minute ago
index-py.html	Initial commit	1 minute ago
index-py.html~	Initial commit	1 minute ago
index-py2.html	Initial commit	1 minute ago
index-py2.html~	Initial commit	1 minute ago