Exercise: Computer Systems and Software - Git

Problems for exercises and homework for the ["Software Technologies" course @ Software University.]()

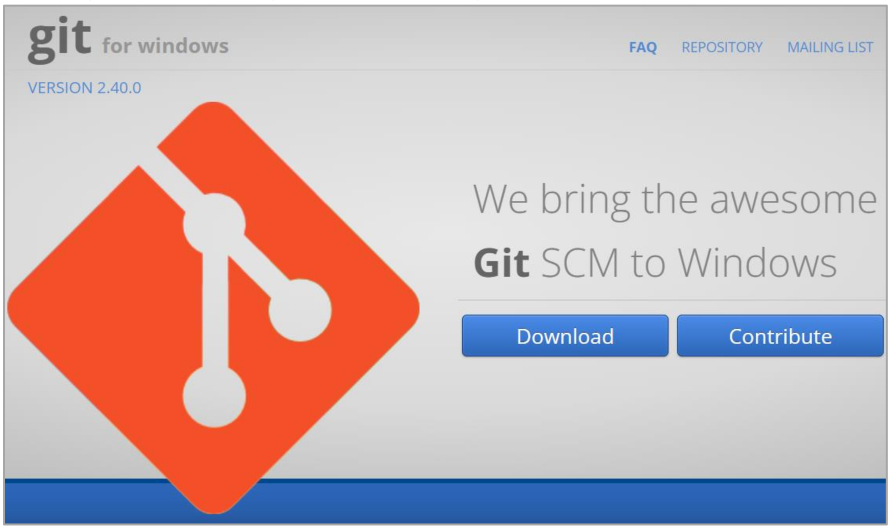
1. What is it and why you need it

Git is a distributed **version control system** that allows developers to track changes in their code and collaborate with others. It is platform-agnostic and can be used on various operating systems, including Windows, macOS, and Linux. It is a useful tool for enhancing testers' efficiency and collaboration by providing version control and traceability for test artifacts, facilitating teamwork and streamlining the testing process.

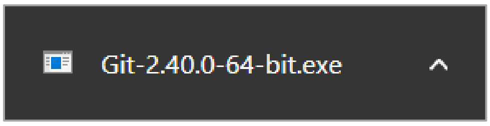
Git for Windows, is a specific distribution of Git that is tailored to work seamlessly on the Windows operating system.

2. How to install

1. Navigate to https://gitforwindows.org/ and click **Download**



2. The .exe file will be downloaded to your browser.

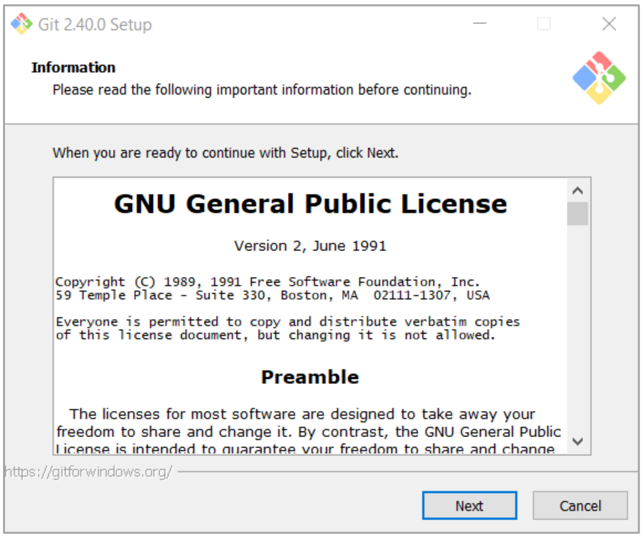


Git-2.40.0-64-bit.exe

If you need the 32-bit version, go to:

https://github.com/git-for-windows/git/releases/download/v2.40.0.windows.1/MinGit-2.40.0-32-bit.zip

3. Double click on .exe file to initiate the installation process. When prompted by Windows, give permission to make changes. You will get a General Public License Information screen. Click "Next" button.



Git 2.40.0 Setup

Information

Please read the following important information before continuing.

When you are ready to continue with Setup, click Next.

GNU General Public License

Version 2, June 1991

Copyright (C) 1989, 1991 Free Software Foundation, Inc.
59 Temple Place - Suite 330, Boston, MA 02111-1307, USA

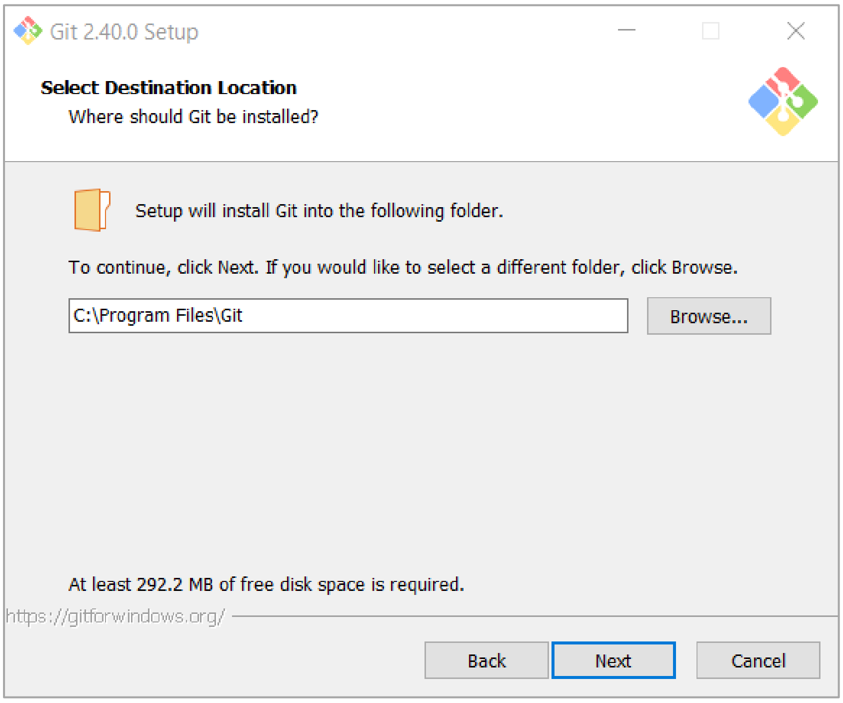
Everyone is permitted to copy and distribute verbatim copies
of this license document, but changing it is not allowed.

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change

https://gitforwindows.org/

4. **Choose the desired path** where you want to install Git.



Select Destination Location

Where should Git be installed?

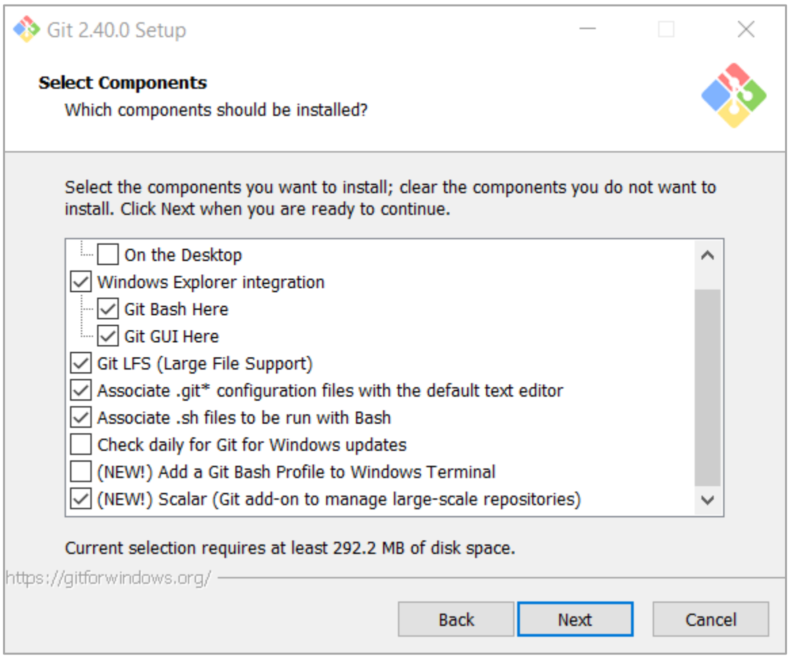
Setup will install Git into the following folder.

To continue, click Next. If you would like to select a different folder, click Browse.

C:\Program Files\Git

At least 292.2 MB of free disk space is required.

5. Leave the Select Components screen as it is. **Don't change anything**. Click **Next.**



Select Components

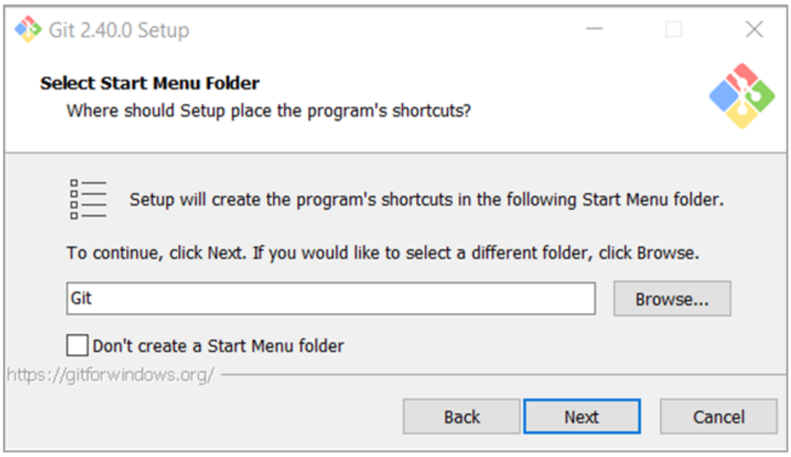
Which components should be installed?

Select the components you want to install; clear the components you do not want to install. Click Next when you are ready to continue.

- □ On the Desktop
- ☑ Windows Explorer integration
  - ☑ Git Bash Here
  - ☑ Git GUI Here
- ☑ Git LFS (Large File Support)
- ☑ Associate .git* configuration files with the default text editor
- ☑ Associate .sh files to be run with Bash
- □ Check daily for Git for Windows updates
- □ (NEW!) Add a Git Bash Profile to Windows Terminal
- ☑ (NEW!) Scalar (Git add-on to manage large-scale repositories)

Current selection requires at least 292.2 MB of disk space.

6. **Select Start Menu Folder** or not to create Start Menu Folder



Select Start Menu Folder

Where should Setup place the program's shortcuts?

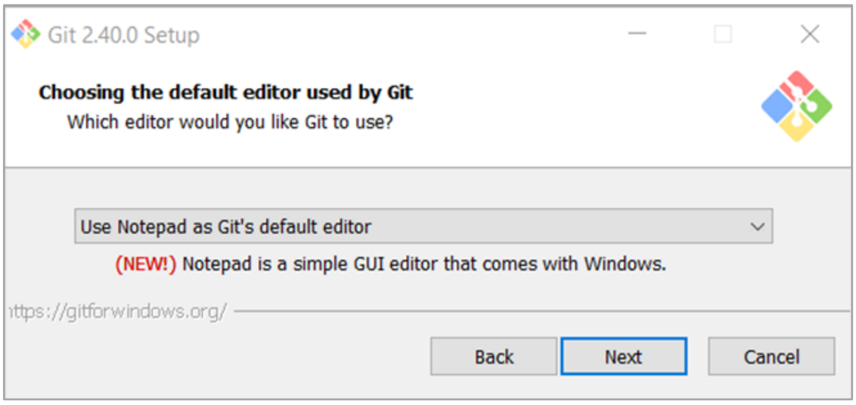
Setup will create the program's shortcuts in the following Start Menu folder.

To continue, click Next. If you would like to select a different folder, click Browse.

Git

□ Don't create a Start Menu folder

7. Choose Notepad or Notepad++ for the default editor.



Git 2.40.0 Setup

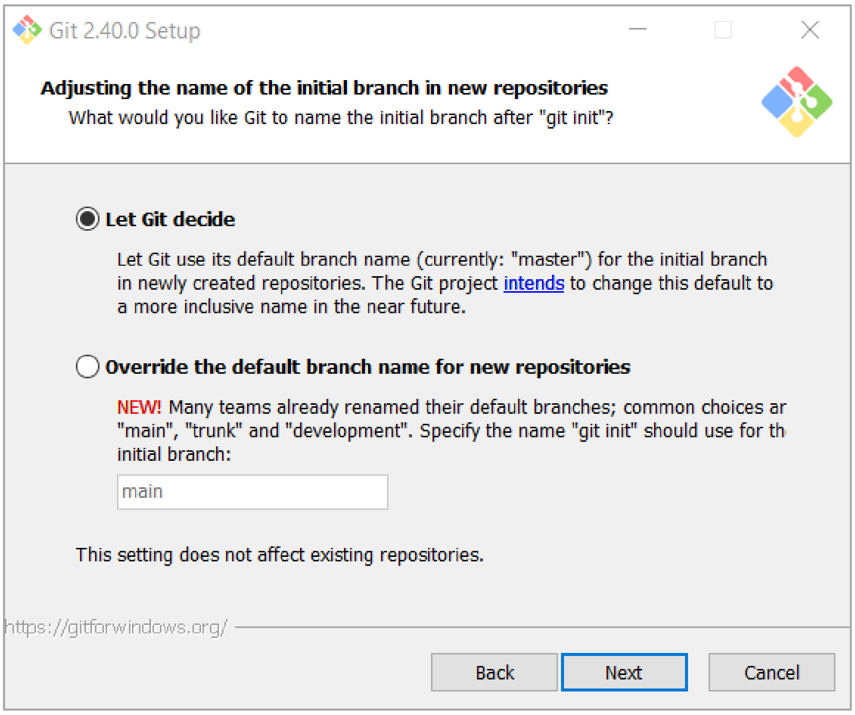
Choosing the default editor used by Git

Which editor would you like Git to use?

Use Notepad as Git's default editor

(NEW!) Notepad is a simple GUI editor that comes with Windows.

8. Let Git decide for the initial branch.



Git 2.40.0 Setup

Adjusting the name of the initial branch in new repositories

What would you like Git to name the initial branch after "git init"?

● **Let Git decide**

Let Git use its default branch name (currently: "master") for the initial branch in newly created repositories. The Git project intends to change this default to a more inclusive name in the near future.

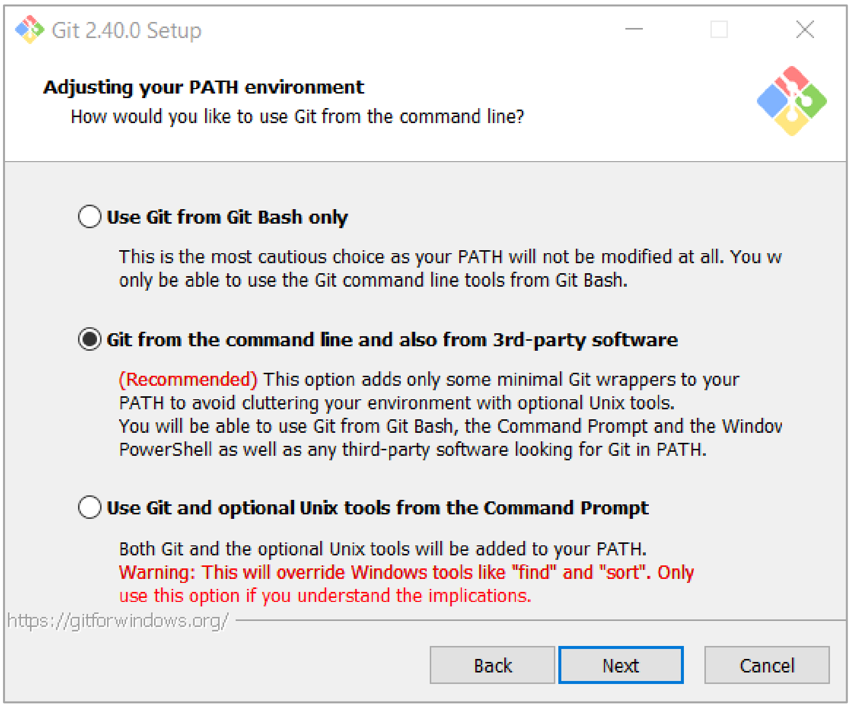
○ **Override the default branch name for new repositories**

NEW! Many teams already renamed their default branches; common choices ar "main", "trunk" and "development". Specify the name "git init" should use for th initial branch:

main

This setting does not affect existing repositories.

9. Choose the second option to be able to use Git from Command Prompt.



Git 2.40.0 Setup

Adjusting your PATH environment

How would you like to use Git from the command line?

○ **Use Git from Git Bash only**

This is the most cautious choice as your PATH will not be modified at all. You w only be able to use the Git command line tools from Git Bash.

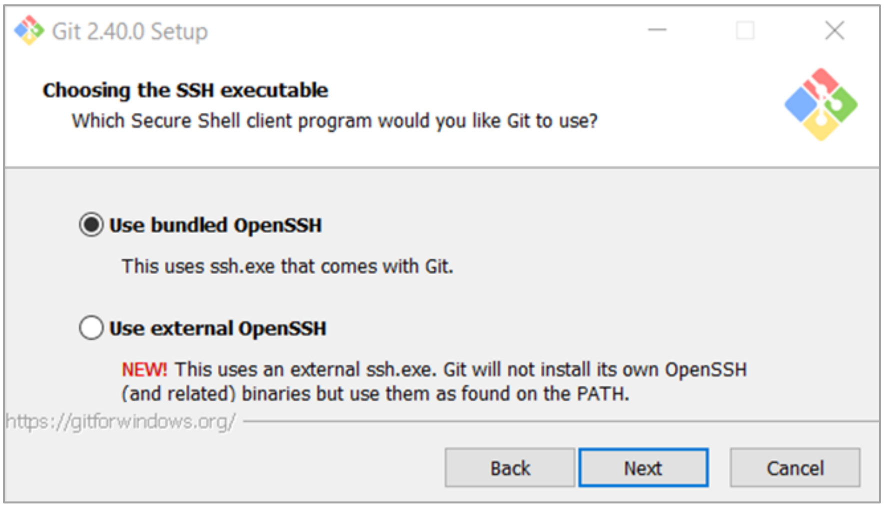
● **Git from the command line and also from 3rd-party software**

(Recommended) This option adds only some minimal Git wrappers to your PATH to avoid cluttering your environment with optional Unix tools. You will be able to use Git from Git Bash, the Command Prompt and the Windov PowerShell as well as any third-party software looking for Git in PATH.

○ **Use Git and optional Unix tools from the Command Prompt**

Both Git and the optional Unix tools will be added to your PATH.
Warning: This will override Windows tools like "find" and "sort". Only use this option if you understand the implications.

10. Leave this option as it is.



Choosing the SSH executable

Which Secure Shell client program would you like Git to use?

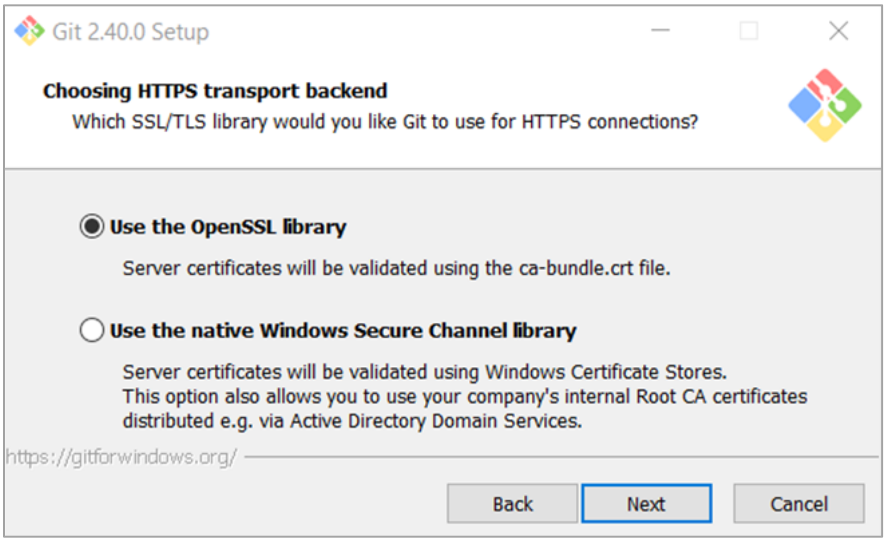
● **Use bundled OpenSSH**

This uses ssh.exe that comes with Git.

○ **Use external OpenSSH**

NEW! This uses an external ssh.exe. Git will not install its own OpenSSH (and related) binaries but use them as found on the PATH.

11. Leave this option as it is as well.



Choosing HTTPS transport backend

Which SSL/TLS library would you like Git to use for HTTPS connections?

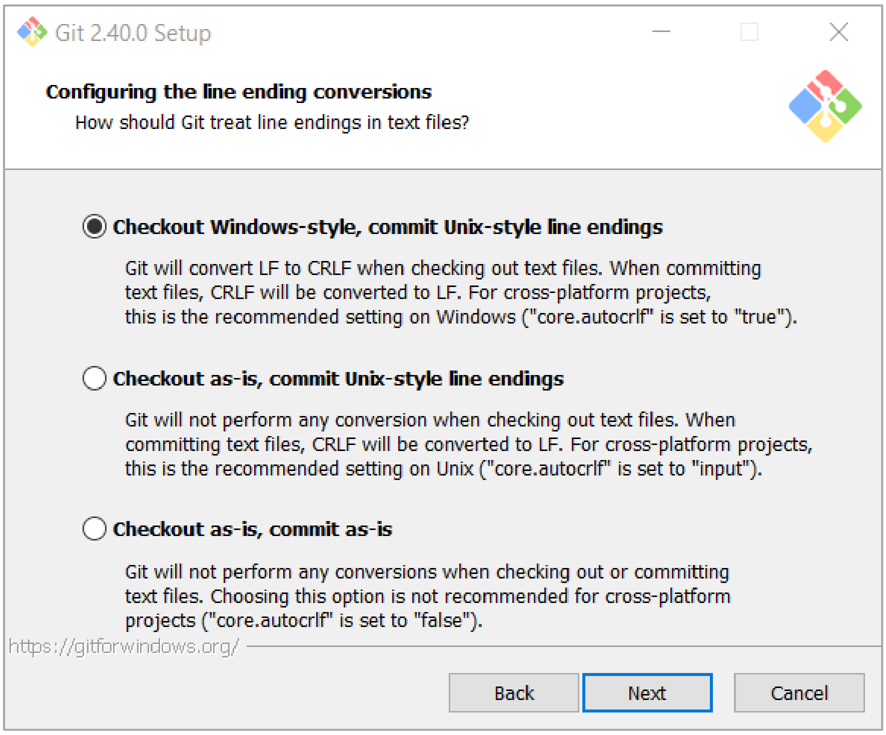
● **Use the OpenSSL library**

Server certificates will be validated using the ca-bundle.crt file.

○ **Use the native Windows Secure Channel library**

Server certificates will be validated using Windows Certificate Stores. This option also allows you to use your company's internal Root CA certificates distributed e.g. via Active Directory Domain Services.

12. This one **stays the same** as well.



Configuring the line ending conversions

How should Git treat line endings in text files?

● **Checkout Windows-style, commit Unix-style line endings**

Git will convert LF to CRLF when checking out text files. When committing text files, CRLF will be converted to LF. For cross-platform projects, this is the recommended setting on Windows ("core.autocrlf" is set to "true").

○ **Checkout as-is, commit Unix-style line endings**

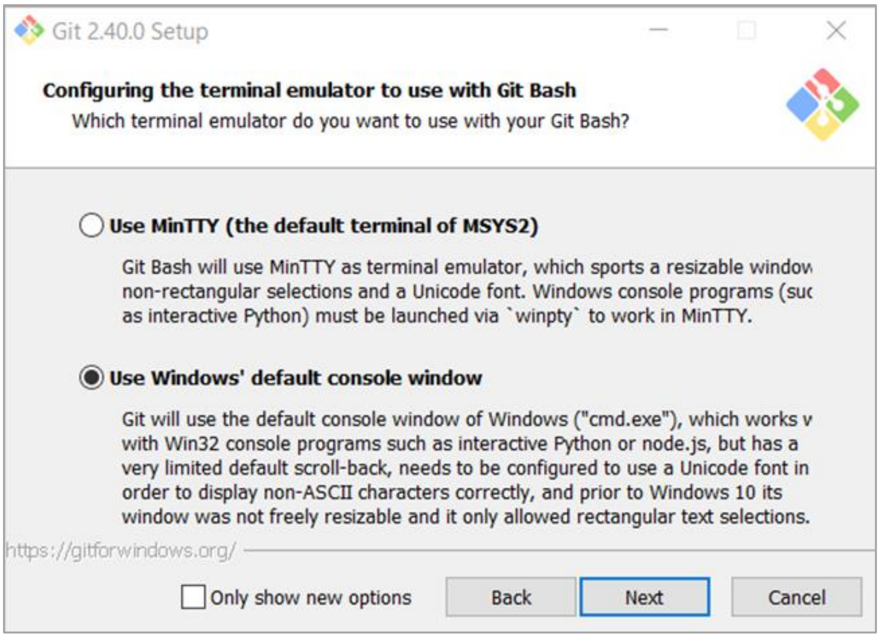
Git will not perform any conversion when checking out text files. When committing text files, CRLF will be converted to LF. For cross-platform projects, this is the recommended setting on Unix ("core.autocrlf" is set to "input").

○ **Checkout as-is, commit as-is**

Git will not perform any conversions when checking out or committing text files. Choosing this option is not recommended for cross-platform projects ("core.autocrlf" is set to "false").

© SoftUni – about.softuni.bg. Copyrighted document. Unauthorized copy, reproduction or use is not permitted.

13. Select **Use Windows' default console window** option.



Git 2.40.0 Setup

Configuring the terminal emulator to use with Git Bash

Which terminal emulator do you want to use with your Git Bash?

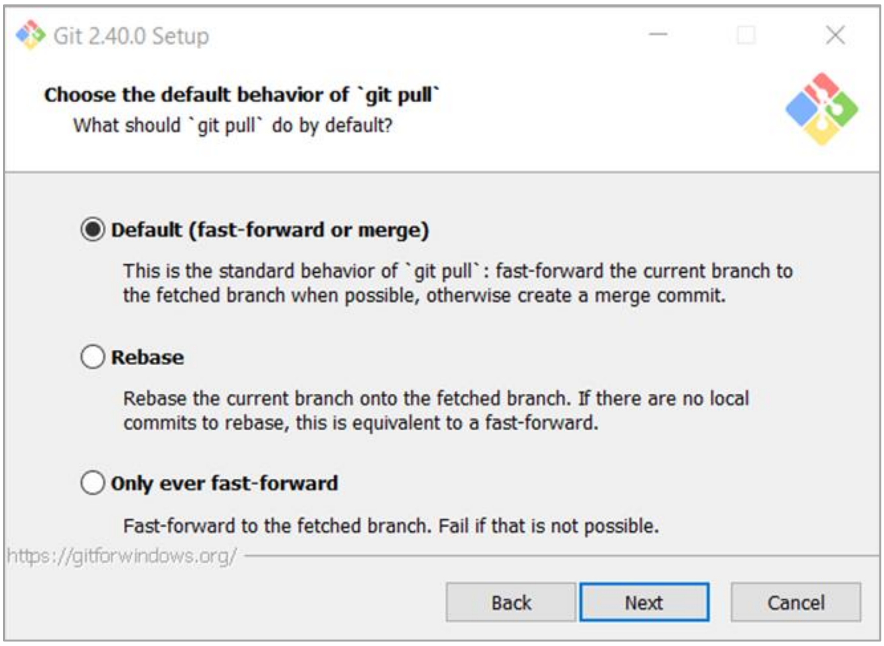
○ **Use MinTTY (the default terminal of MSYS2)**

Git Bash will use MinTTY as terminal emulator, which sports a resizable window non-rectangular selections and a Unicode font. Windows console programs (suc as interactive Python) must be launched via `winpty` to work in MinTTY.

● **Use Windows' default console window**

Git will use the default console window of Windows ("cmd.exe"), which works v with Win32 console programs such as interactive Python or node.js, but has a very limited default scroll-back, needs to be configured to use a Unicode font in order to display non-ASCII characters correctly, and prior to Windows 10 its window was not freely resizable and it only allowed rectangular text selections.

14. Default behavior – **Default.**



Git 2.40.0 Setup

Choose the default behavior of `git pull`

What should `git pull` do by default?

● **Default (fast-forward or merge)**

This is the standard behavior of `git pull`: fast-forward the current branch to the fetched branch when possible, otherwise create a merge commit.

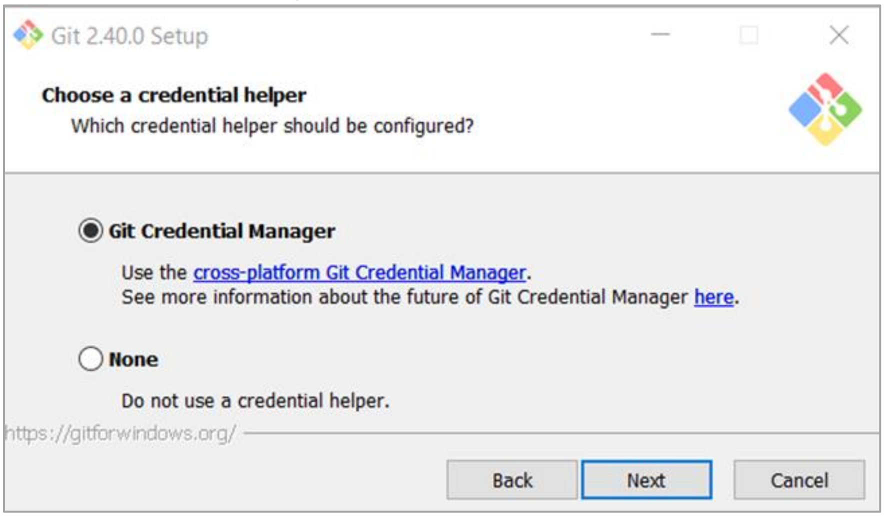
○ **Rebase**

Rebase the current branch onto the fetched branch. If there are no local commits to rebase, this is equivalent to a fast-forward.

○ **Only ever fast-forward**

Fast-forward to the fetched branch. Fail if that is not possible.

15. Git Credential Manager



Git 2.40.0 Setup

Choose a credential helper

Which credential helper should be configured?

● **Git Credential Manager**

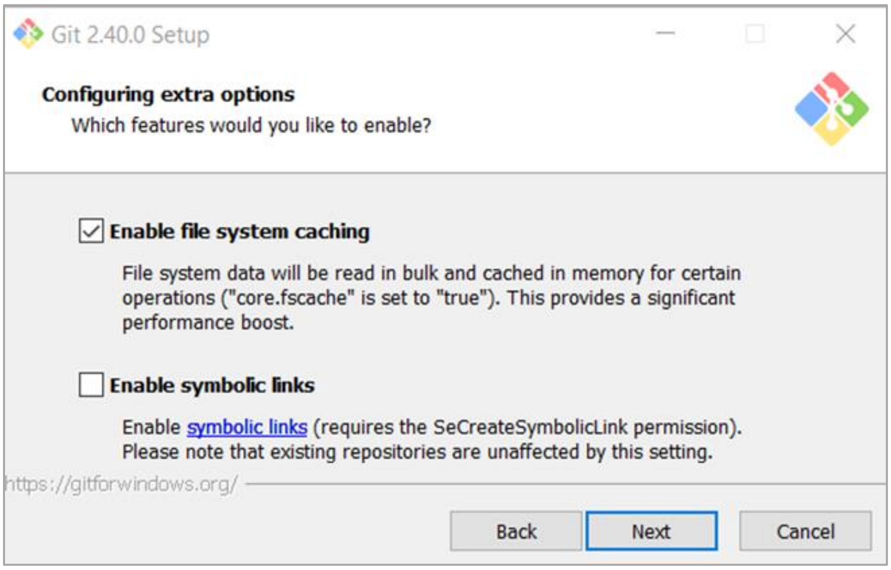
Use the cross-platform Git Credential Manager.
See more information about the future of Git Credential Manager here.

○ **None**

Do not use a credential helper.

© SoftUni – about.softuni.bg. Copyrighted document. Unauthorized copy, reproduction or use is not permitted.

16. Enable file system caching



Configuring extra options

Which features would you like to enable?

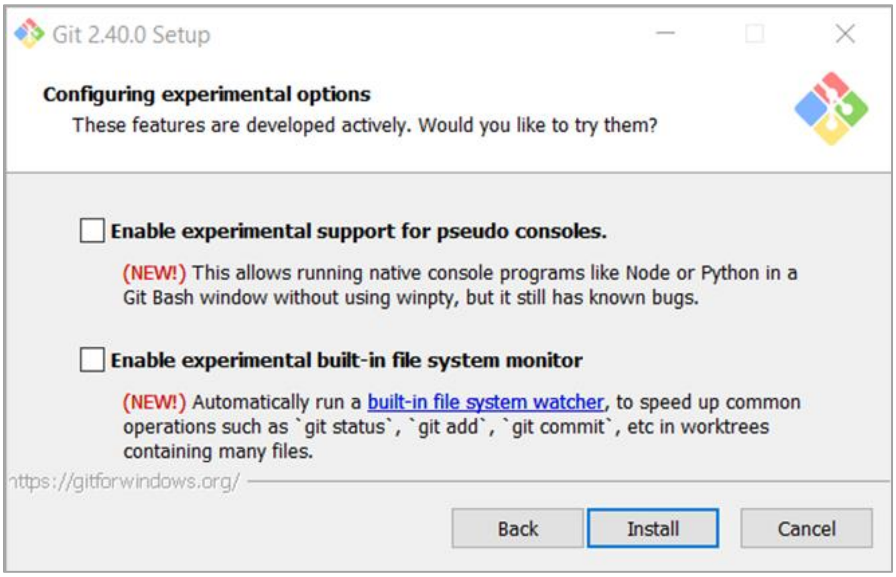
☑ **Enable file system caching**

File system data will be read in bulk and cached in memory for certain operations ("core.fscache" is set to "true"). This provides a significant performance boost.

□ **Enable symbolic links**

Enable symbolic links (requires the SeCreateSymbolicLink permission). Please note that existing repositories are unaffected by this setting.

17. Leave the **experimental options unchecked. Click Install.**



Configuring experimental options

These features are developed actively. Would you like to try them?

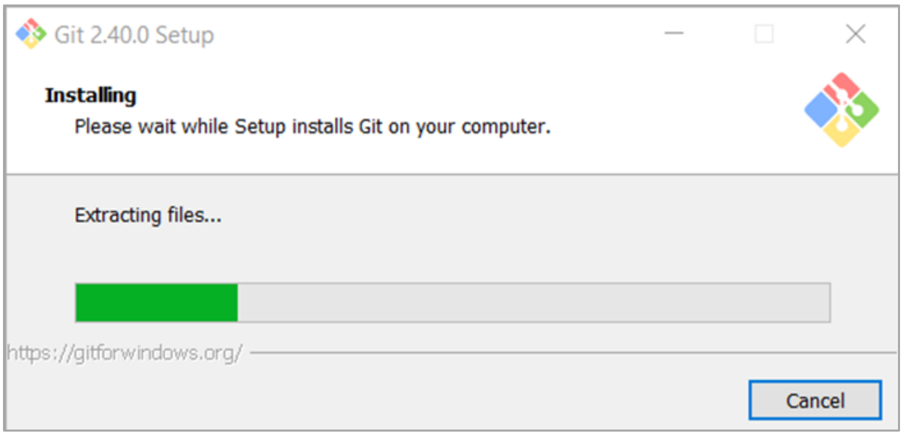
□ **Enable experimental support for pseudo consoles.**

(NEW!) This allows running native console programs like Node or Python in a Git Bash window without using winpty, but it still has known bugs.

□ **Enable experimental built-in file system monitor**

(NEW!) Automatically run a built-in file system watcher, to speed up common operations such as `git status`, `git add`, `git commit`, etc in worktrees containing many files.

18. Installing…



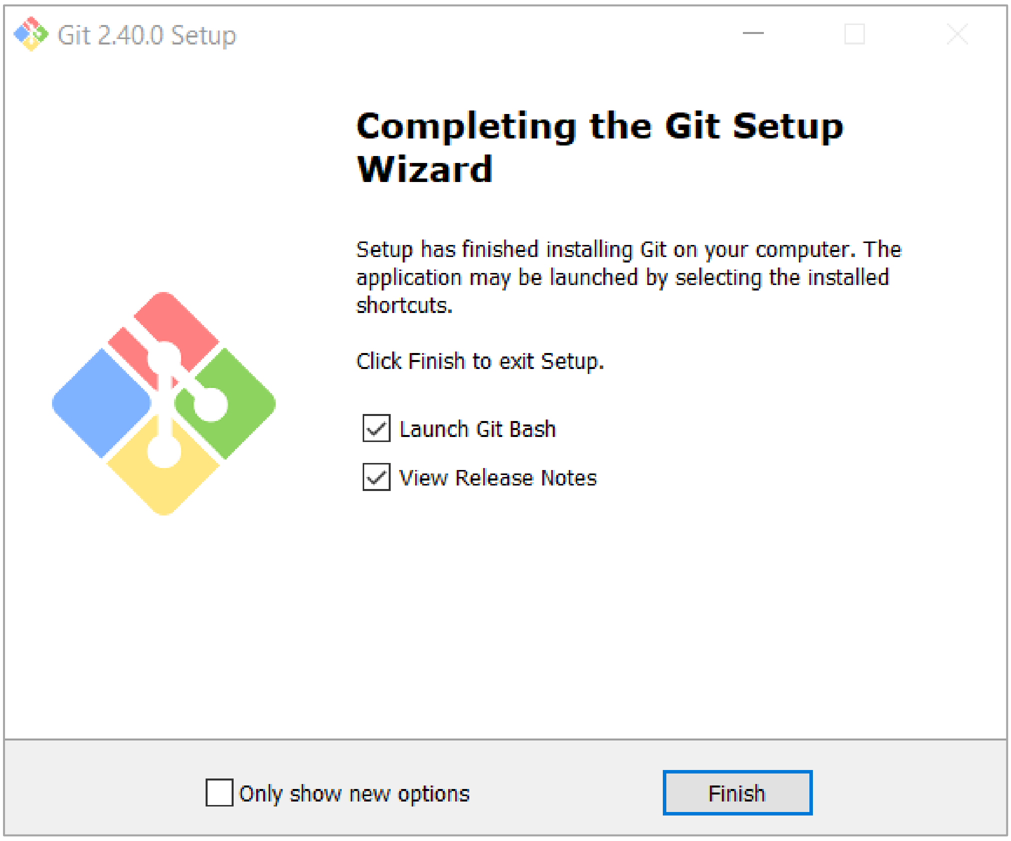
Installing

Please wait while Setup installs Git on your computer.

Extracting files...

19. Complete the setup by pressing **Finish.**

© SoftUni – about.softuni.bg. Copyrighted document. Unauthorized copy, reproduction or use is not permitted.



Completing the Git Setup Wizard

Setup has finished installing Git on your computer. The application may be launched by selecting the installed shortcuts.

Click Finish to exit Setup.

☑ Launch Git Bash

☑ View Release Notes

□ Only show new options

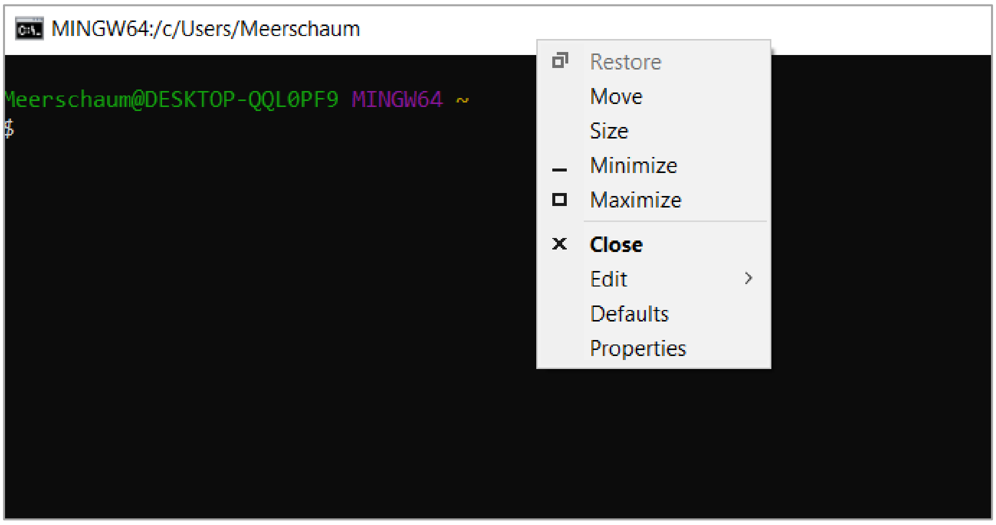
3. Check Git version

To **check the Git version**, run the following command:

- from the command prompt **`git version`**
- from git bash **`$ git –version`**

4. Turn on/off Copy/Paste options

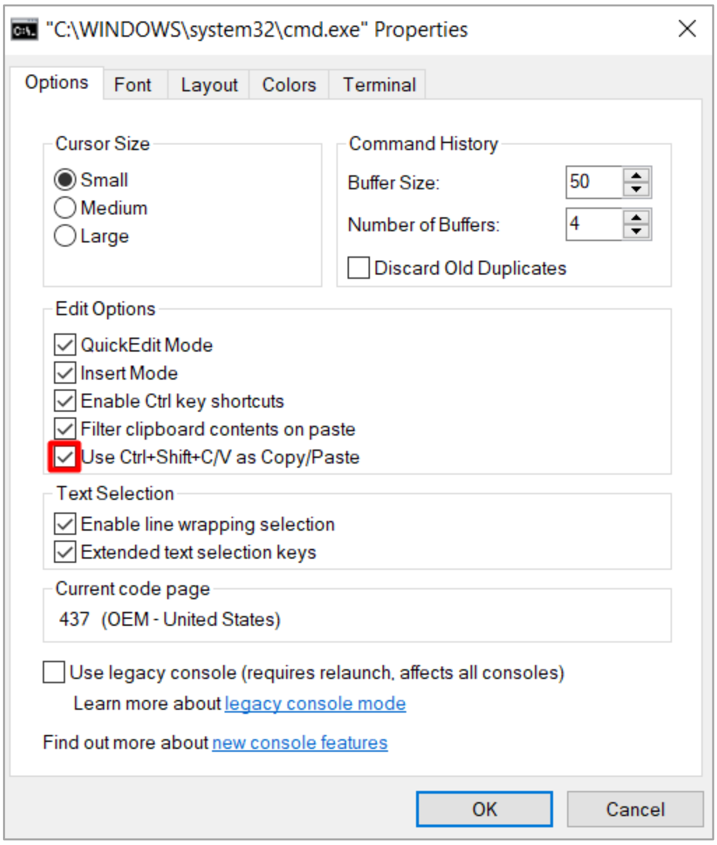
Keep in mind that by default copy/paste options in git bash are disabled, so in order do use them, you have to right-click on the title bar and choose properties.



```
Meerschaum@DESKTOP-QQL0PF9 MINGW64 ~
$
```

A new window will pop up, where you should make sure that the following option is checked: **Use Ctrl+Shift+C/V as Copy/Paste**

© SoftUni – about.softuni.bg. Copyrighted document. Unauthorized copy, reproduction or use is not permitted.



"C:\WINDOWS\system32\cmd.exe" Properties

Cursor Size

● Small
○ Medium
○ Large

Command History

Buffer Size: 50

Number of Buffers: 4

□ Discard Old Duplicates

Edit Options

☑ QuickEdit Mode
☑ Insert Mode
☑ Enable Ctrl key shortcuts
☑ Filter clipboard contents on paste
☑ Use Ctrl+Shift+C/V as Copy/Paste

Text Selection

☑ Enable line wrapping selection
☑ Extended text selection keys

Current code page

437 (OEM - United States)

□ Use legacy console (requires relaunch, affects all consoles)

Learn more about legacy console mode

Find out more about new console features

5. Clone GitHub repository

For the following exercise you can use **command prompt** or **git bash**. The syntax is very similar. We are using Git Bash, since it's colourful.

To **change directories**, use the command **cd** followed by the **name of the directory**. In our case we would like to clone the repository on **drive D**, so we're navigating to D:// by typing the following command:

```
$ cd d://
```

Now, on drive D, we want to **create a folder** in which to store the cloned repo. We do this by the following command:

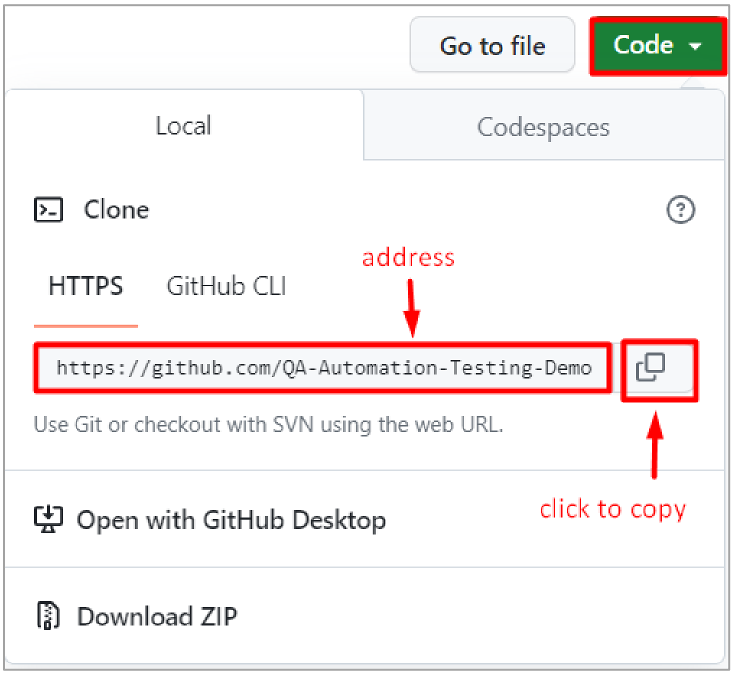
```
$ mkdir MyFirstGitClone
```

Let's check **if the folder is successfully created**. We will try to open it. Type:

```
$ cd MyFirstGitClone
```

Now that we have our folder ready, we need a **repo to clone**. Don't worry if you don't have GitHub profile for now. Navigate to our demo repository https://github.com/QA-Automation-Testing-Demo/GitDemo and click on the green button, labeled "Code" and copy the address of the repo.

© SoftUni – about.softuni.bg. Copyrighted document. Unauthorized copy, reproduction or use is not permitted.



address

https://github.com/QA-Automation-Testing-Demo

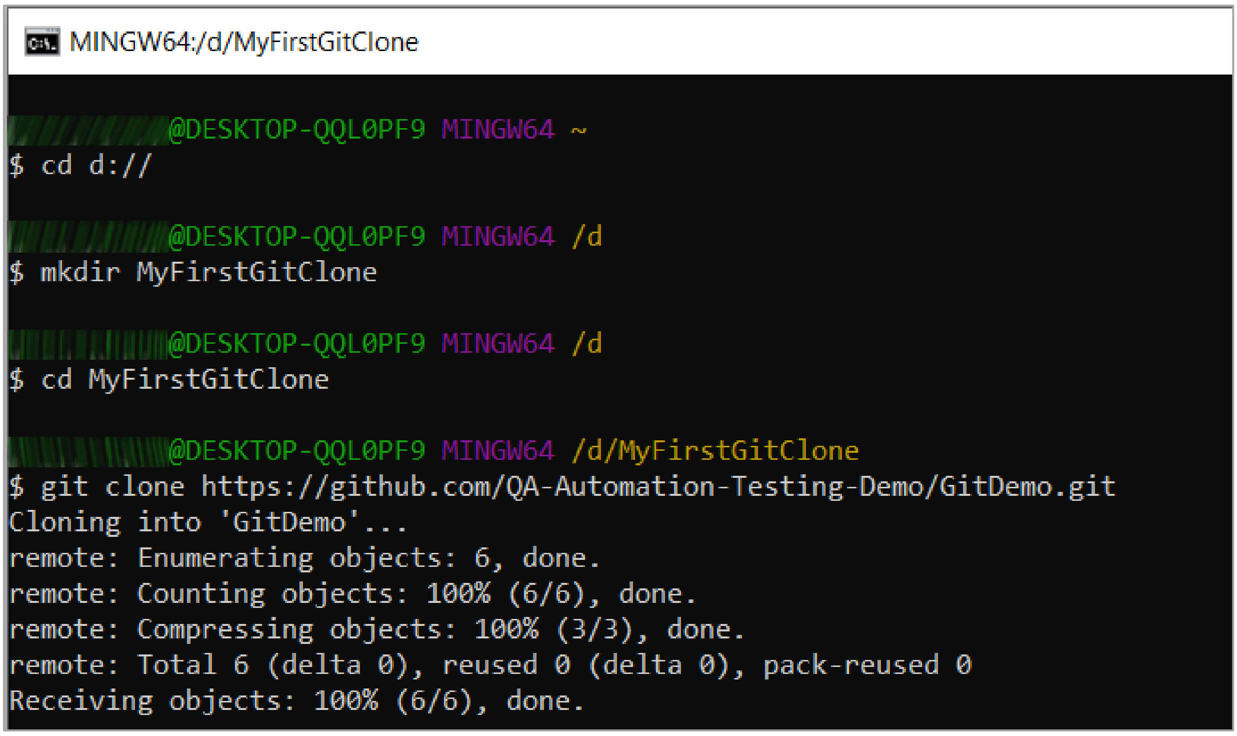
Use Git or checkout with SVN using the web URL.

click to copy

So now that we have our **folder ready** and our **repository ready**, let's clone. Type:

```
$ git clone https://github.com/QA-Automation-Testing-Demo/GitDemo.git
```

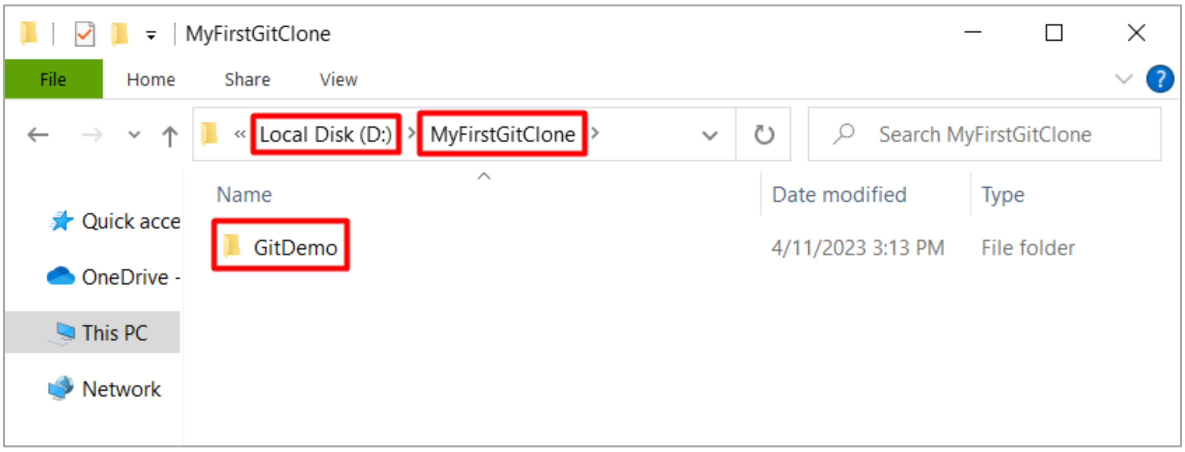
This is how the whole sequence of commands should look like:



```
[redacted]@DESKTOP-QQL0PF9 MINGW64 ~
$ cd d://

[redacted]@DESKTOP-QQL0PF9 MINGW64 /d
$ mkdir MyFirstGitClone

[redacted]@DESKTOP-QQL0PF9 MINGW64 /d
$ cd MyFirstGitClone

[redacted]@DESKTOP-QQL0PF9 MINGW64 /d/MyFirstGitClone
$ git clone https://github.com/QA-Automation-Testing-Demo/GitDemo.git
Cloning into 'GitDemo'...
remote: Enumerating objects: 6, done.
remote: Counting objects: 100% (6/6), done.
remote: Compressing objects: 100% (3/3), done.
remote: Total 6 (delta 0), reused 0 (delta 0), pack-reused 0
Receiving objects: 100% (6/6), done.
```

You can check vie Windows Explorer if everything is as it should be.

© SoftUni – about.softuni.bg. Copyrighted document. Unauthorized copy, reproduction or use is not permitted.



Name	Date modified	Type
GitDemo	4/11/2023 3:13 PM	File folder

In **GitDemo folder** there should be a file called **GitDemoFile**, which you can open with Notepad. 😉

© SoftUni – about.softuni.bg. Copyrighted document. Unauthorized copy, reproduction or use is not permitted.