

# Git and GitHub

## Version Control Systems



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**Technical Trainers**



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[sli.do](https://sli.do)

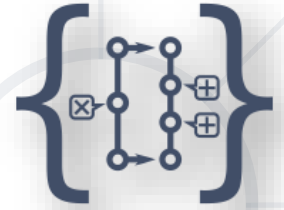
**#fund-common**

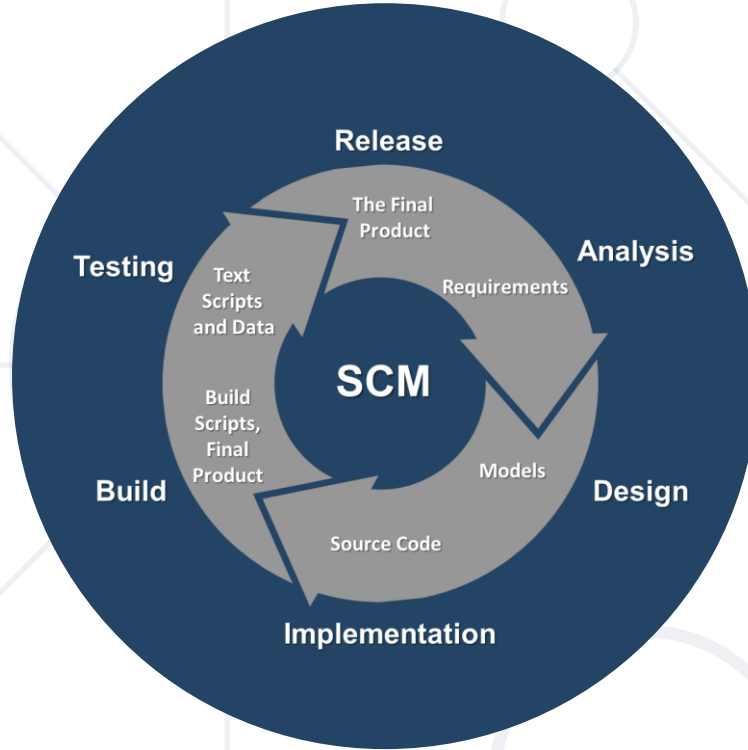
1. Software Configuration Management and Source Control Systems
  - Vocabulary: Clone a Repo, Commit a Changeset, Push the Changes, Pull Changes, Merge Changes
2. Introduction to Git
  - Working with git, Git Bash, and TortoiseGit
3. Introduction to GitHub
  - Create a Repo, Clone, Commit, Push, Conflicts



# Source Control Systems: Lesson Summary

- **Source control systems** keep the source code (+ other project assets) in a shared **repository**
  - Developers can **clone** a repository, **pull** the latest version, **commit** & **push** local changes, view the change logs, etc.
- **Git** is the most popular source control system
  - Other version control systems: SVN, TFS, Perforce
- **GitHub** is the #1 site for Git project hosting
  - Git hosting + issue tracker + project tracker + build system





# Software Configuration Management

Working on Shared Code: Source Control Systems

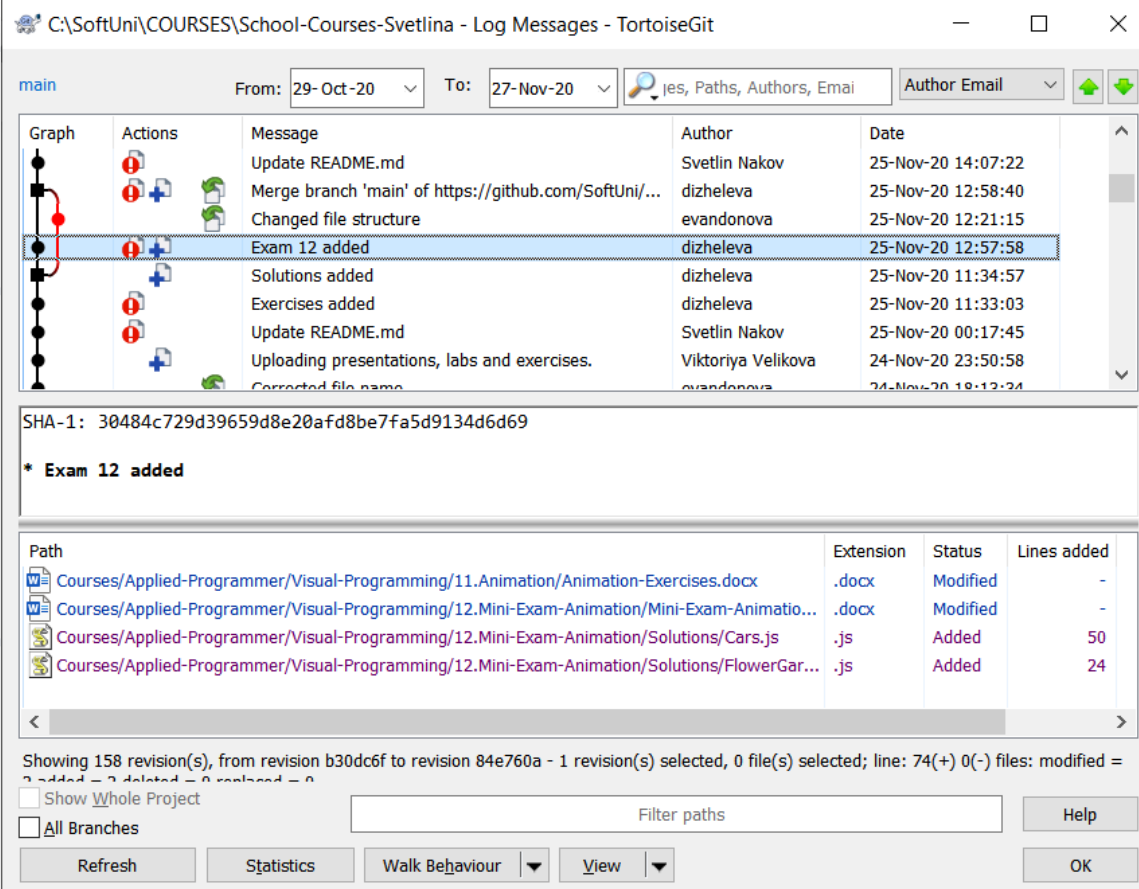
# Software Configuration Management

- **Version control**  $\approx$  Software Configuration Management (SCM)  $\approx$  **source control system**
- A software engineering discipline
- Consists of techniques, practices and tools for working on **shared source code** and files
- Mechanisms for management, control and **tracking the changes**
- Defines the process of **change management**
- Keeps track of what is happening in the project over time
- Solves **conflicts** in the changes



# Change Log

- Version control systems keep their own **change log** (version history). It shows
  - Who?
  - When?
  - Why?
  - What had been changed?
- Old versions could be **restored**

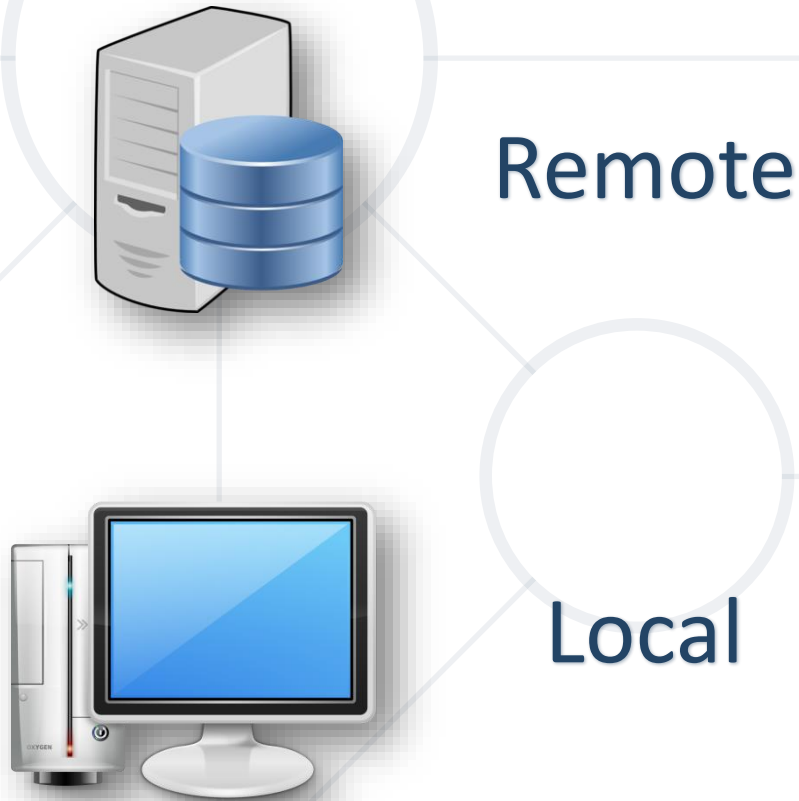


The screenshot shows the 'Log Messages' window in TortoiseGit for the repository 'C:\SoftUni\COURSES\School-Courses-Svetlina'. The window displays a list of commits with columns for Graph, Actions, Message, Author, and Date. The commit 'Exam 12 added' by 'dizheleva' is selected. Below the list, the SHA-1 hash '30484c729d39659d8e20afd8be7fa5d9134d6d69' is shown, followed by the commit message '\* Exam 12 added'. A table at the bottom lists the files changed in the selected commit, including their paths, extensions, status, and lines added.

Path	Extension	Status	Lines added
Courses/Applied-Programmer/Visual-Programming/11.Animation/Animation-Exercises.docx	.docx	Modified	-
Courses/Applied-Programmer/Visual-Programming/12.Mini-Exam-Animation/Mini-Exam-Animatio...	.docx	Modified	-
Courses/Applied-Programmer/Visual-Programming/12.Mini-Exam-Animation/Solutions/Cars.js	.js	Added	50
Courses/Applied-Programmer/Visual-Programming/12.Mini-Exam-Animation/Solutions/FlowerGar...	.js	Added	24

# Vocabulary: Repository (Repo)

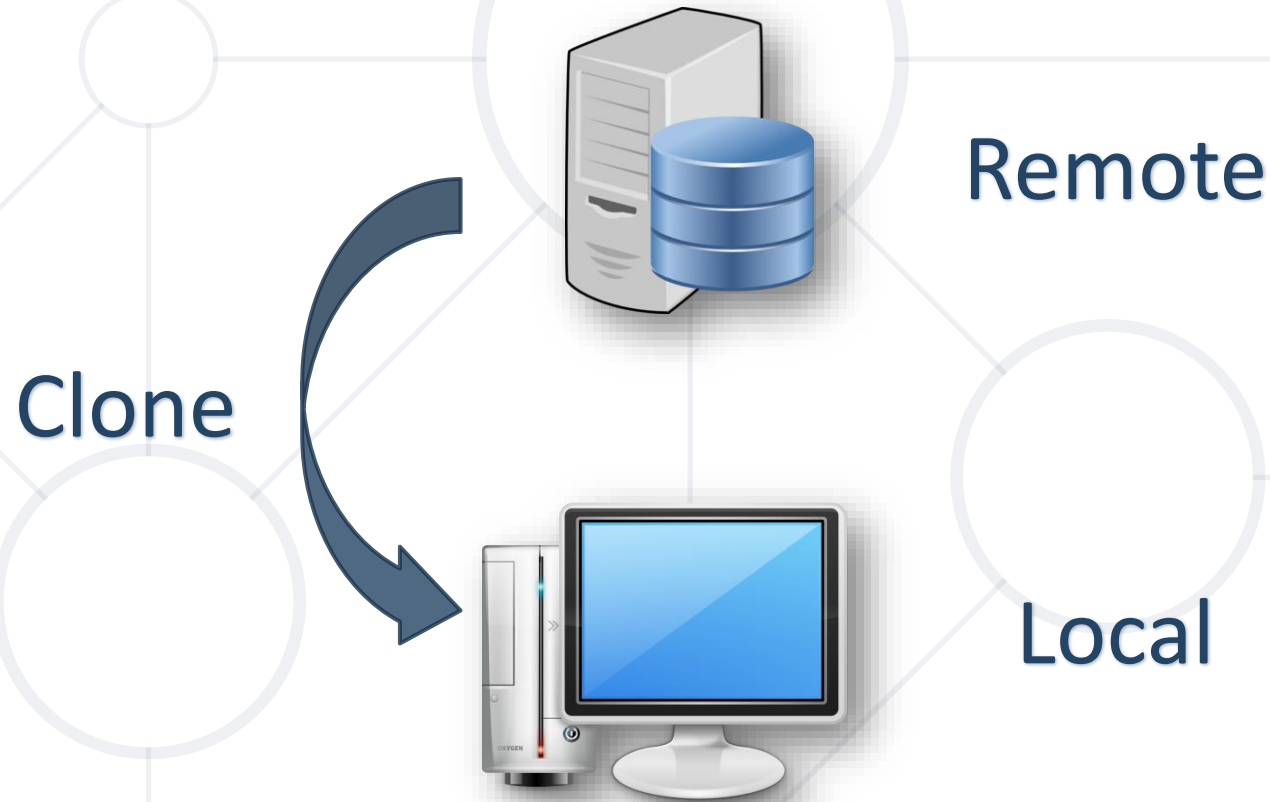
- **Repo** holds the project in a remote server



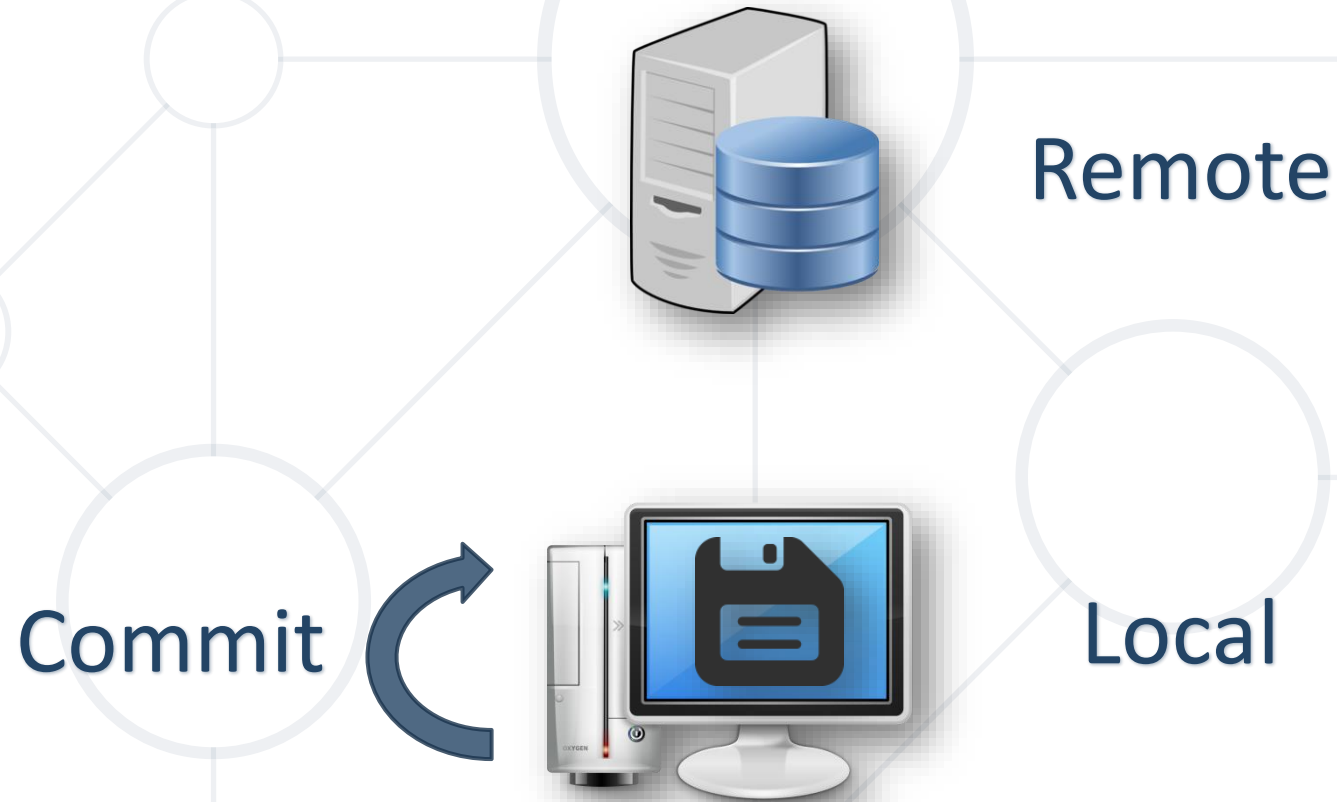


# Vocabulary: Clone

- **Clone** == download a **local copy** of the remote project

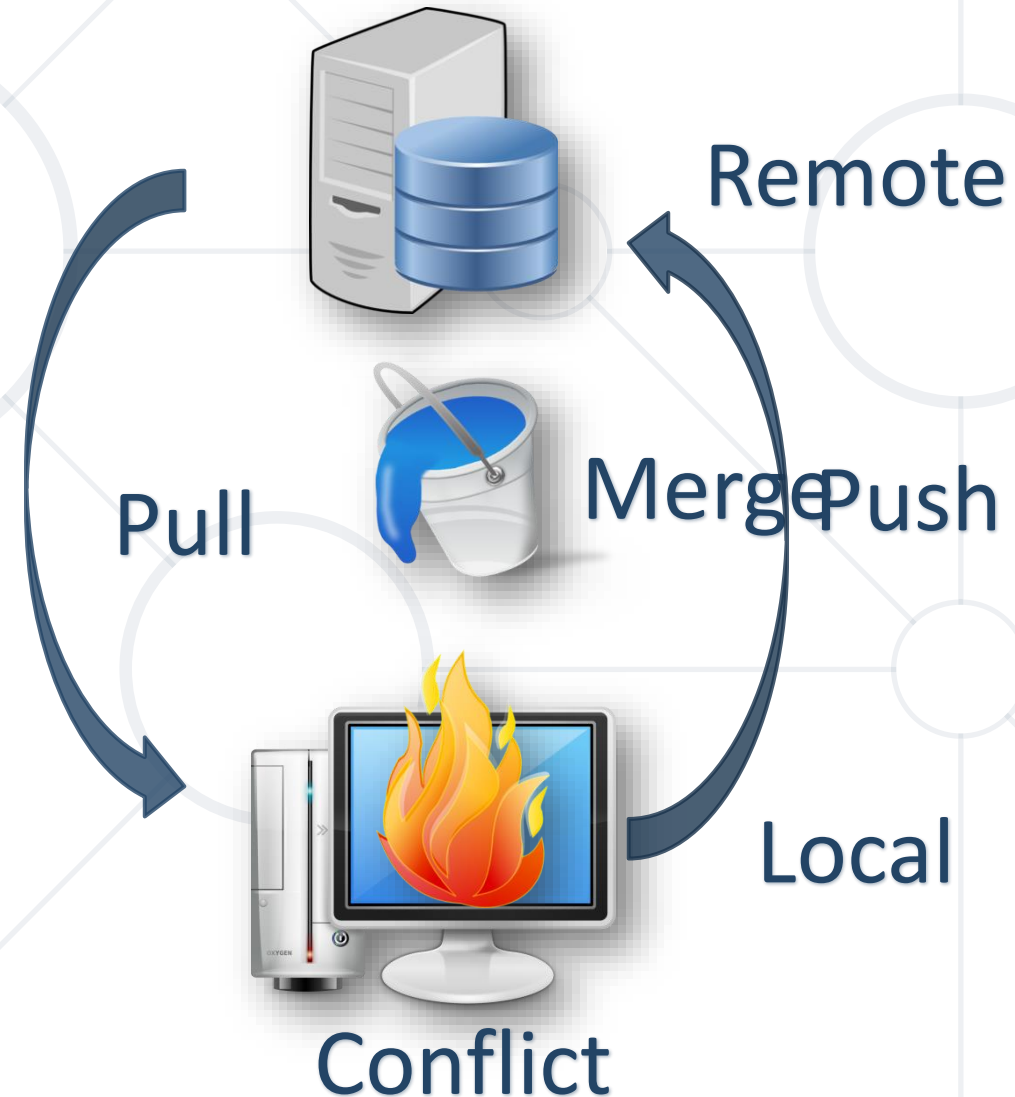


- **Commit** == saves a set of changes locally



# Vocabulary: Sync (Pull / Push)

- **Pull** – **take** and **merge** the changes from the Remote
- **Push** – **send** local changes to the Remote



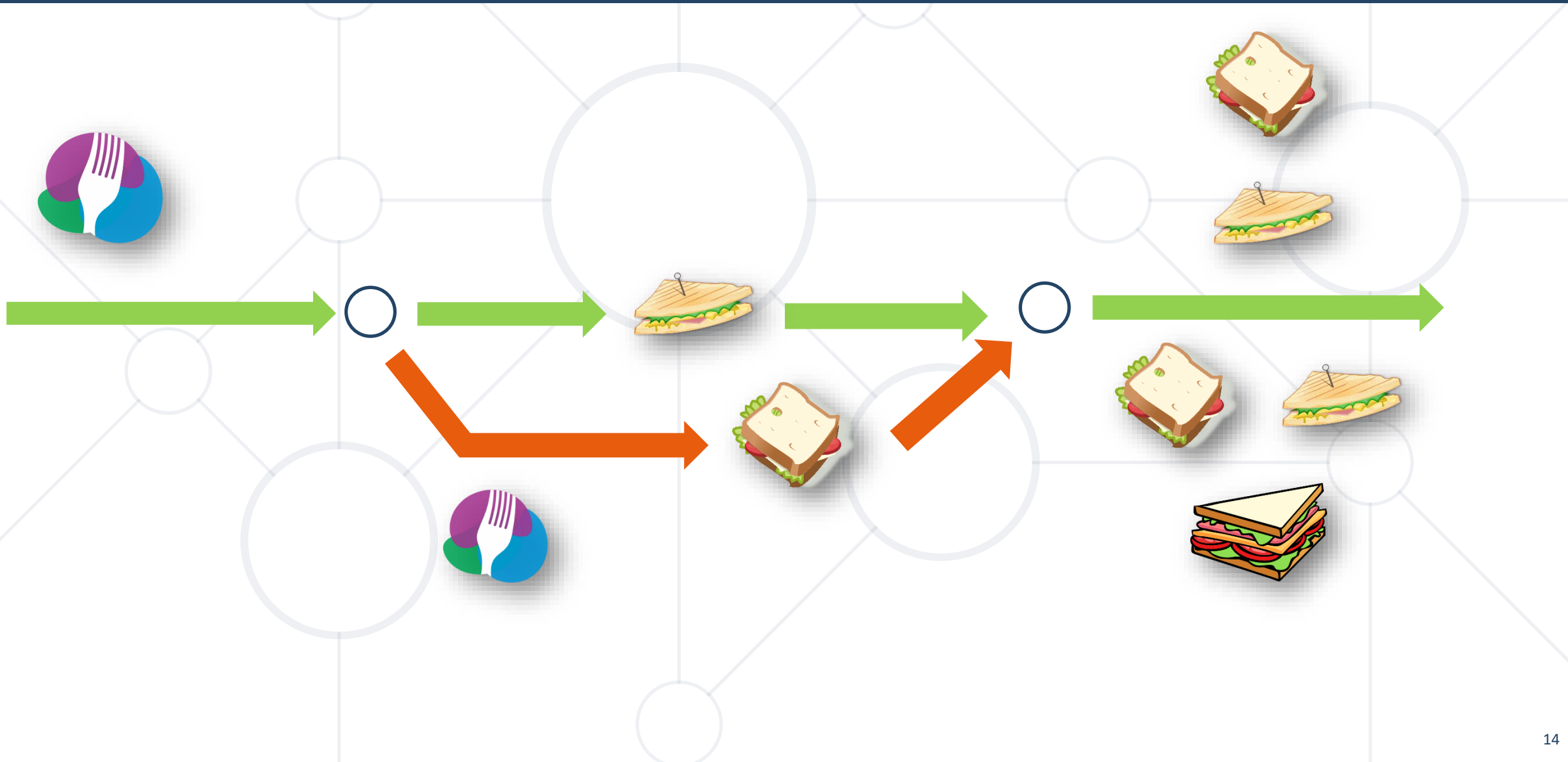
# Vocabulary: Branch



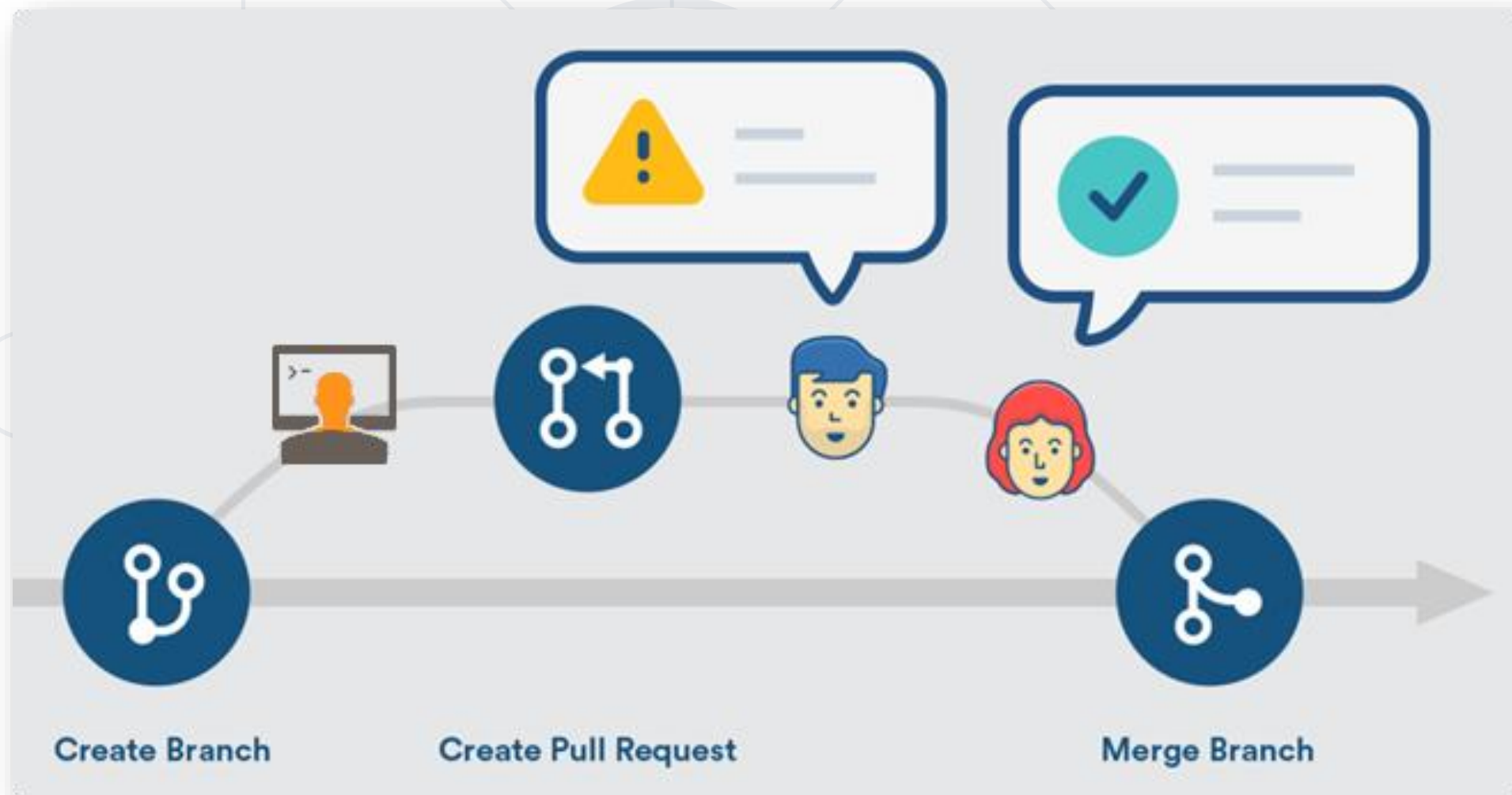
# Vocabulary: Merge Branches



# Example: Branches



# Pull Requests: The Code Review Process





**Git**

World's #1 Source Control System



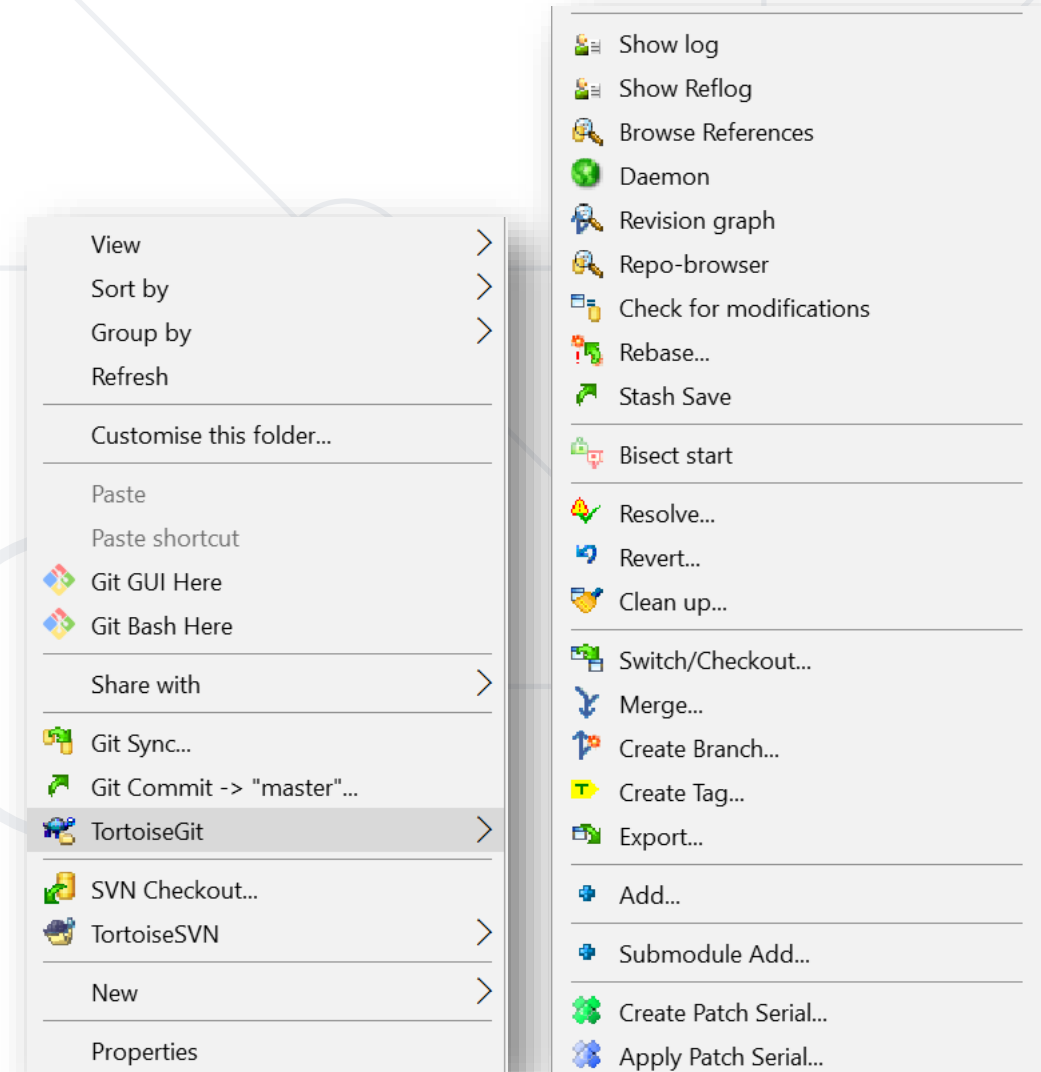
# What is Git?

- **Git** == distributed **source-control system**
  - The most popular in the world
  - Free, open-source software
- Works with **local** and **remote** repositories
- **Git bash** – command line interface for Git
- Runs on Linux, macOS and Windows (**msysGit**)
- <https://git-scm.com>



# Using Git

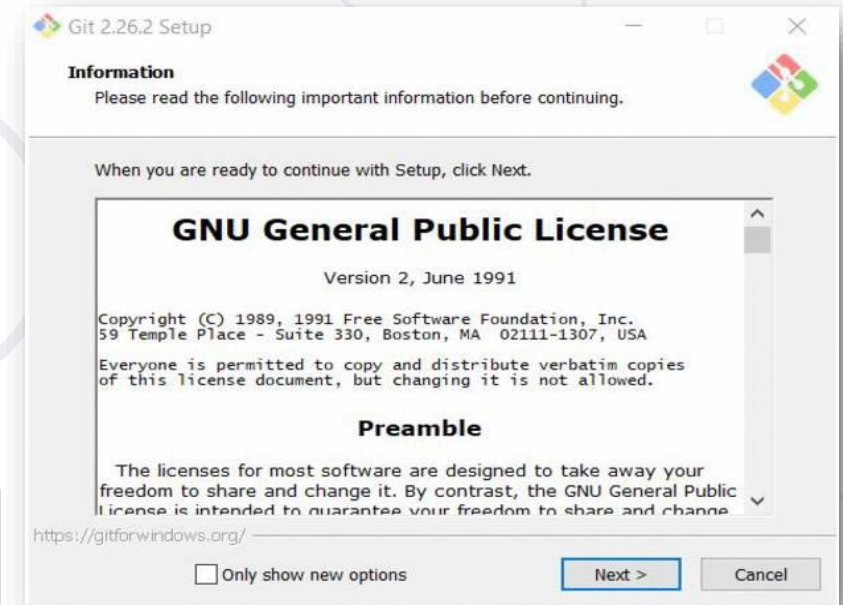
- Console-based Git client
  - **git, Git Bash**
- Windows GUI client – **TortoiseGit**
  - <https://tortoisegit.org/download>
- Visual Studio / Eclipse plug-ins
- **GitHub Desktop** client
  - <https://desktop.github.com>



# Installing Git

- Git installation on Windows: Git for Windows (msysGit)
  - <https://git-scm.com/downloads>
  - Options to select (they should be selected by default)
    - "Use Git Bash Only"
    - "Checkout Windows-style, Commit Unix-style Endings"
- Git installation on Linux:

```
sudo apt-get install git
```



- Cloning an existing Git repository

```
git clone [remote url]
```

- Fetch and merge the latest changes from the remote repository

```
git pull
```

- Preparing (adding / selecting) files for a commit

```
git add [filename] ("git add ." adds everything)
```

- Committing to the local repository

```
git commit -m "[your message here]"
```

- Check the status of your local repository (see the local changes)

```
git status
```

- Creating a new local repository (in the current directory)

```
git init
```

- Creating a remote (assign a short name for remote Git URL)

```
git remote add [remote name] [remote url]
```

- Pushing to a remote (send changes to the remote repository)

```
git push [remote name] [local name]
```



**GitHub**

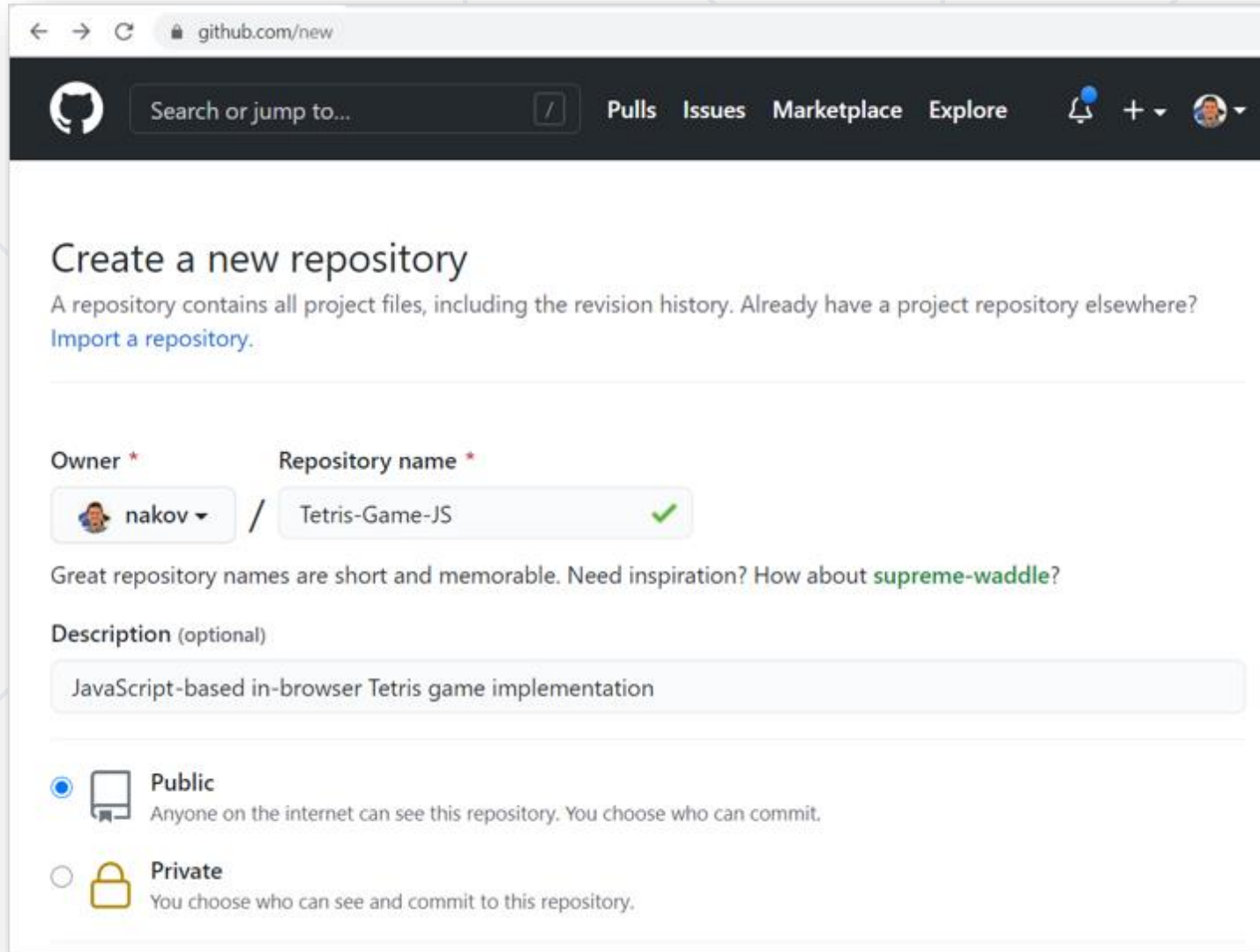
The World's #1 Developer Collaboration Cloud

# What is GitHub?



- **GitHub** is the world's #1 source code hosting site
  - Free for open-source projects
  - Paid plans for private repositories
- GitHub provides
  - Git source code repository
  - Issue tracker (bug tracker)
  - Project board (Kanban style)
  - Wiki pages (documentation)
  - Code reviews (pull requests)
  - Build system (actions)
  - Site hosting (pages)
  - Discussions (forum)

# Creating a GitHub Repository




github.com/new

Search or jump to... Pulls Issues Marketplace Explore

## Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? [Import a repository.](#)


Owner \* Repository name \*


 nakov / Tetris-Game-JS ✓

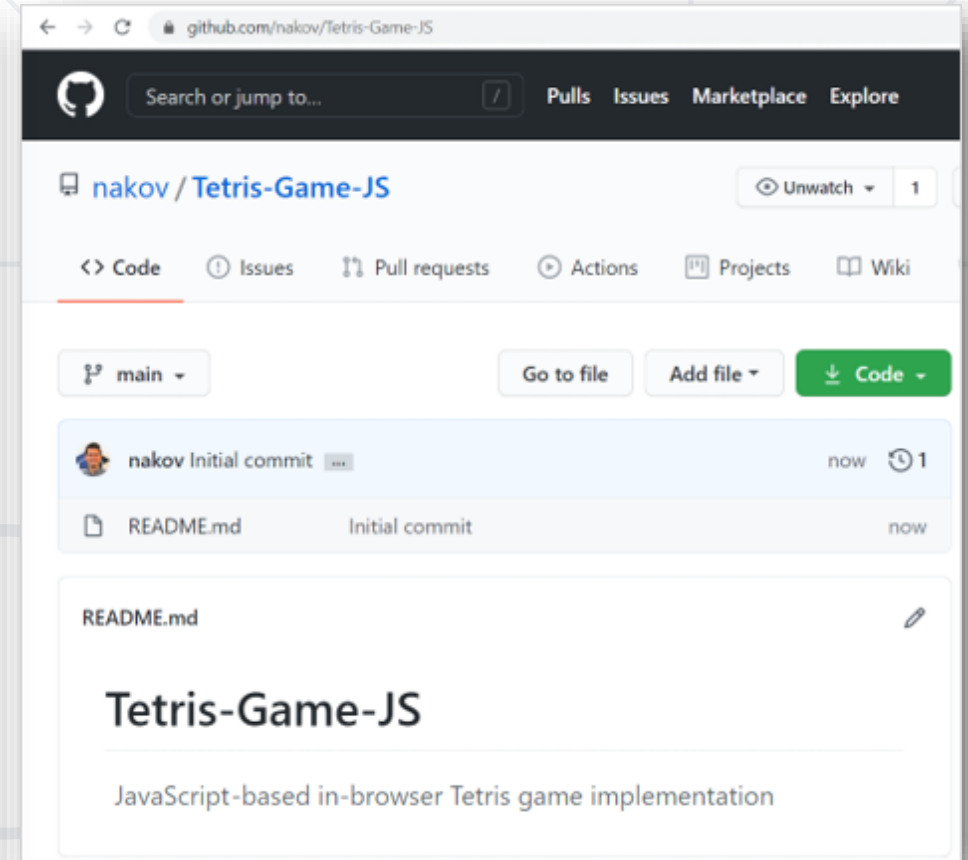
Great repository names are short and memorable. Need inspiration? How about [supreme-waddle?](#)

Description (optional)

JavaScript-based in-browser Tetris game implementation


☒  **Public**  
Anyone on the internet can see this repository. You choose who can commit.

☐  **Private**  
You choose who can see and commit to this repository.




github.com/nakov/Tetris-Game-JS

Search or jump to... Pulls Issues Marketplace Explore

 **nakov** / **Tetris-Game-JS** Unwatch 1

<> Code ⓘ Issues 🔗 Pull requests ⚙️ Actions 📁 Projects 📖 Wiki

main Go to file Add file Code

 nakov Initial commit now 1

README.md Initial commit now

README.md

## Tetris-Game-JS

JavaScript-based in-browser Tetris game implementation



- **Clone** a repository from GitHub

```
git clone https://github.com/SoftUni/playground
```

- **Modify** local files

```
notepad README.md
```

- **Commit** changes (local)

```
git add . & git commit -m "Added something"
```

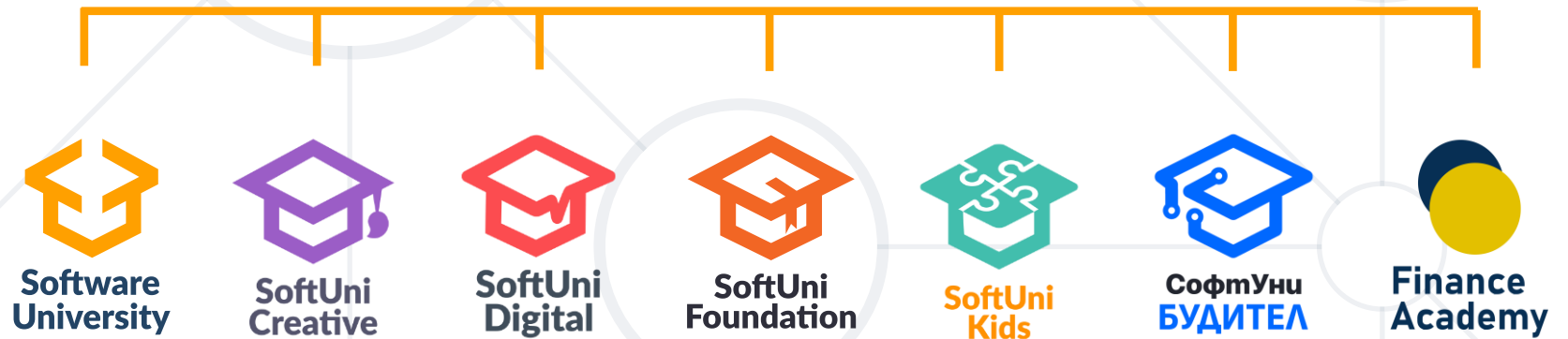
- **Push** the changes to GitHub

```
git push
```

- Use **version control systems** to work in a team
  - Keep the shared code in a central repository
  - Handle merge conflicts with ease
- Important **Git** commands
  - **clone, add, commit, pull, push**
- **GitHub** == the world's most used software project hosting platform
  - Git repository, issue tracker, Kanban board, Wiki



# Questions?



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