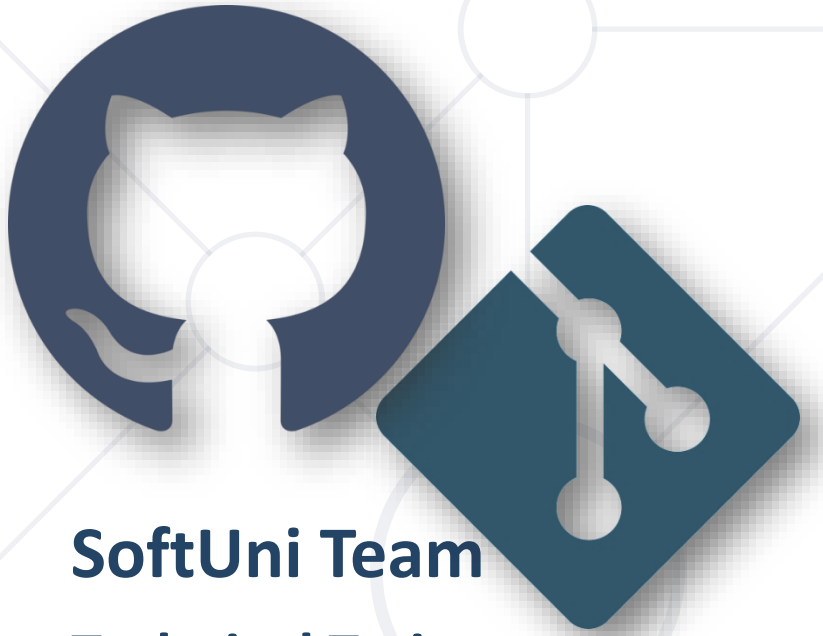
Git and GitHub

Version Control Systems



SoftUni Team

Technical Trainers

Software University

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https://softuni.bg

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   - Create a Repo, Clone, Commit, Push, Conflicts

Source Control Systems: Lesson Summary

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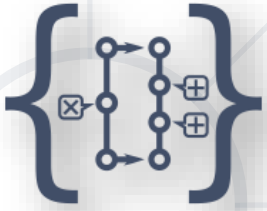
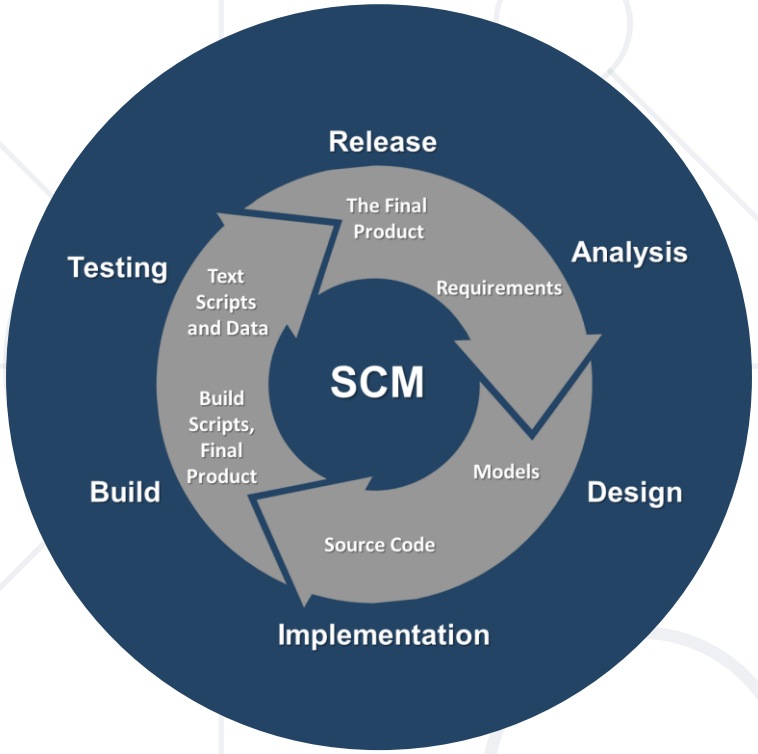
- **Source control systems** keep the source code (+ other project assets) in a shared **repository**
  - Developers can **clone** a repository, **pull** the latest version, **commit** & **push** local changes, view the change logs, etc.



- **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

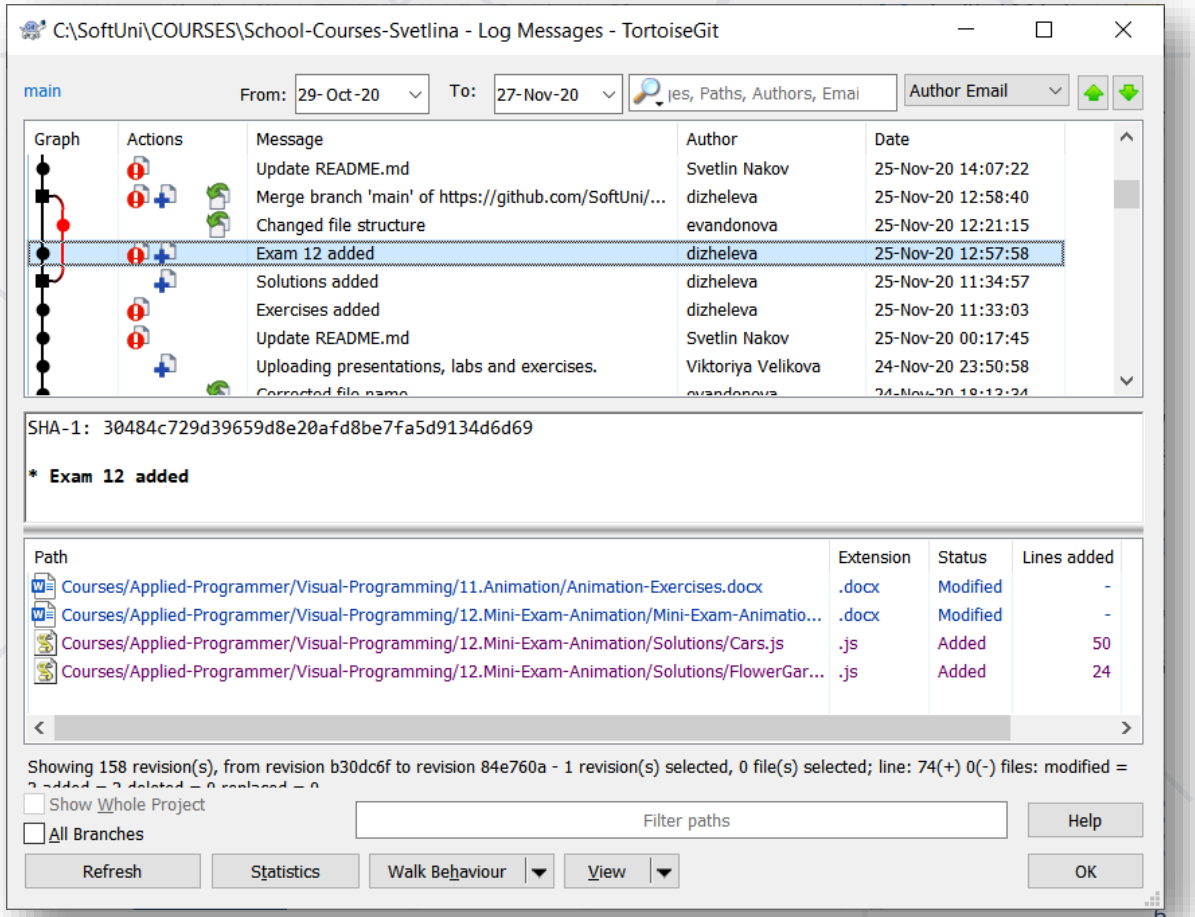
Working on Shared Code: Source Control Systems

Software Configuration Management

- **Version control** ≈ Software Configuration Management (SCM) ≈ **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

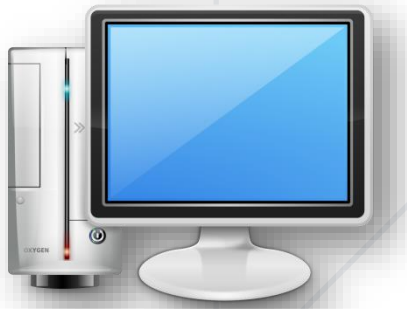
- **Version control systems** keep their own **change log** (version history). It shows
  - Who?
  - When?
  - Why?
  - What had been changed?
- Old versions could be **restored**



Vocabulary: Repository (Repo)

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

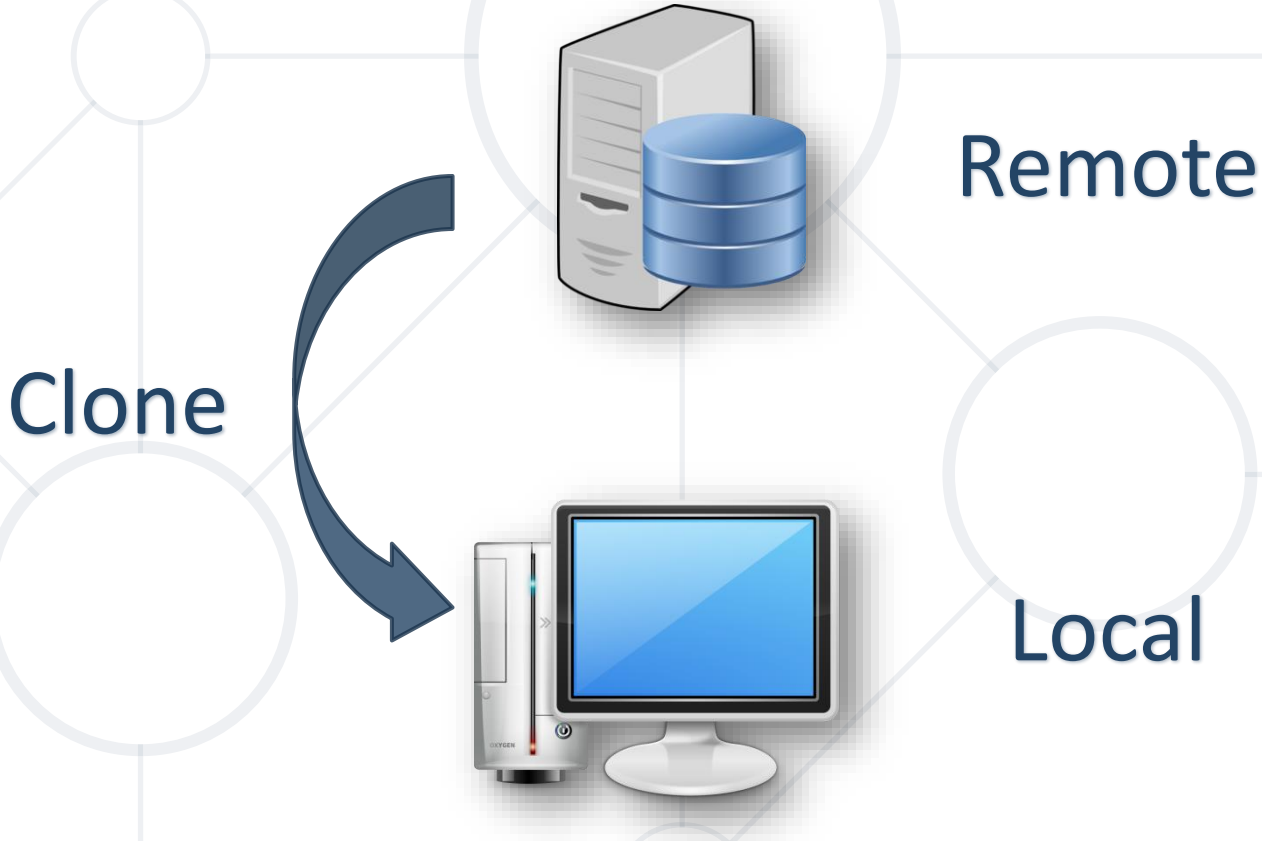
Remote



Local

Vocabulary: Clone

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



Vocabulary: Commit

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

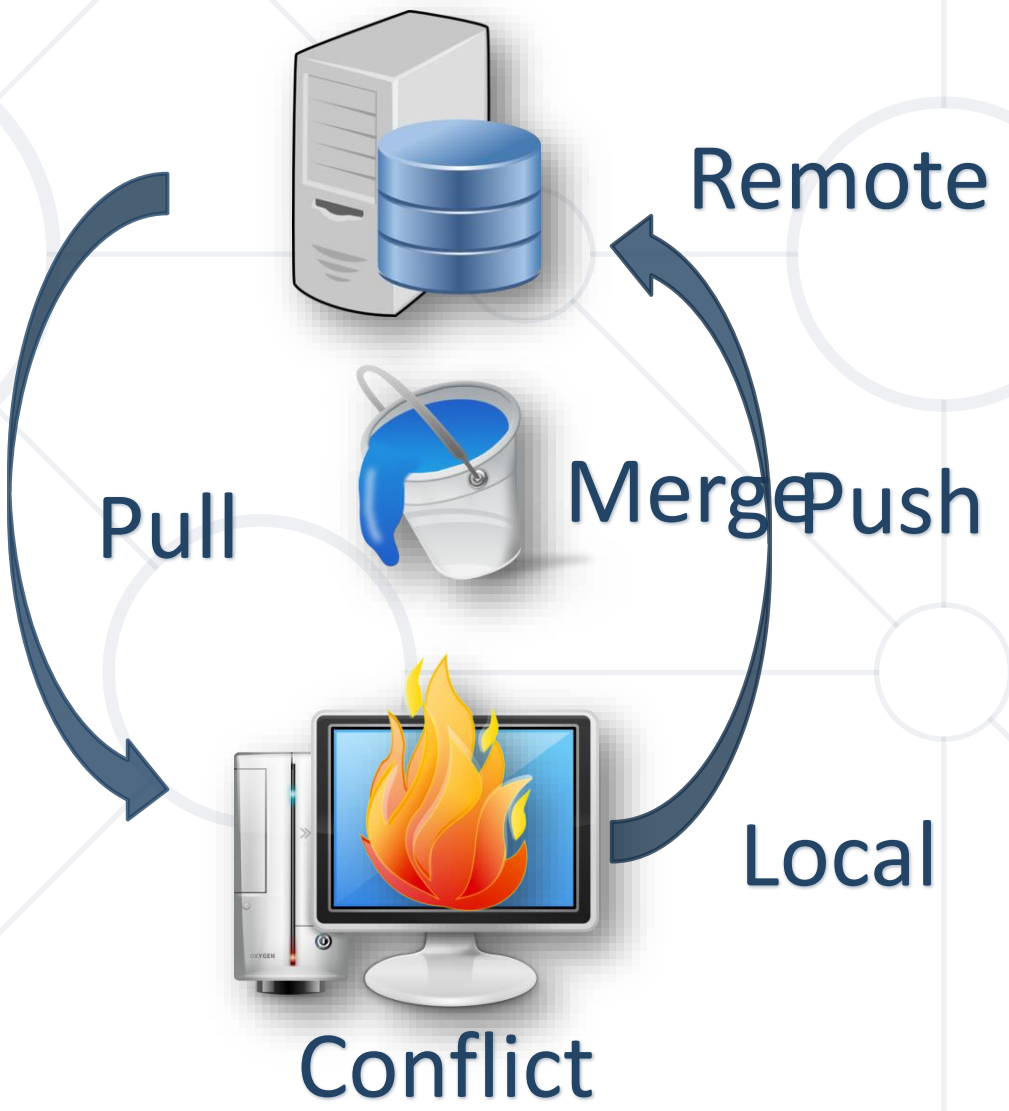
Remote

Commit

Local

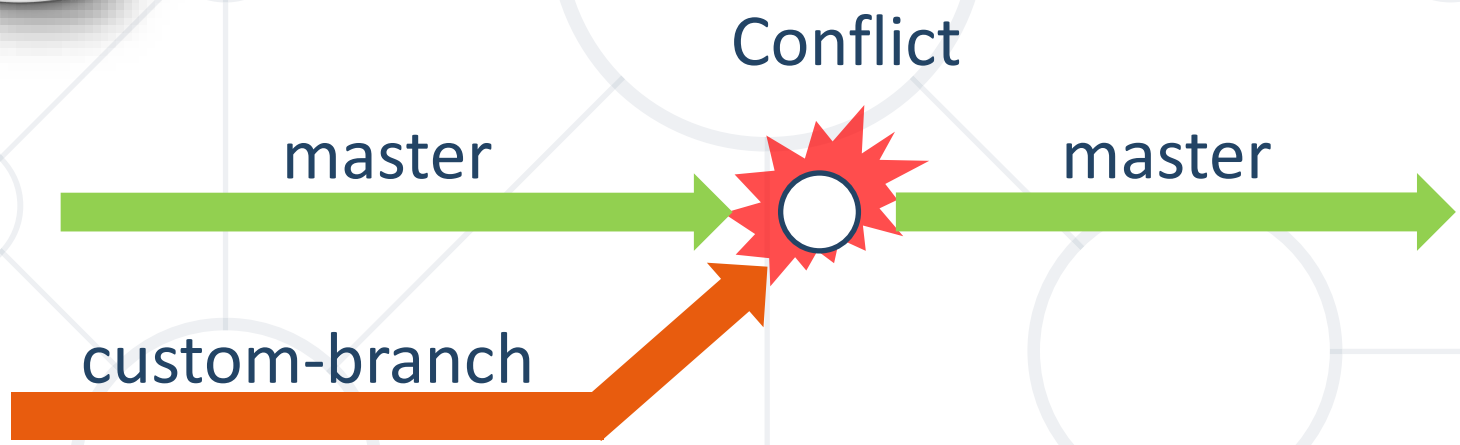
Vocabulary: Sync (Pull / Push)

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

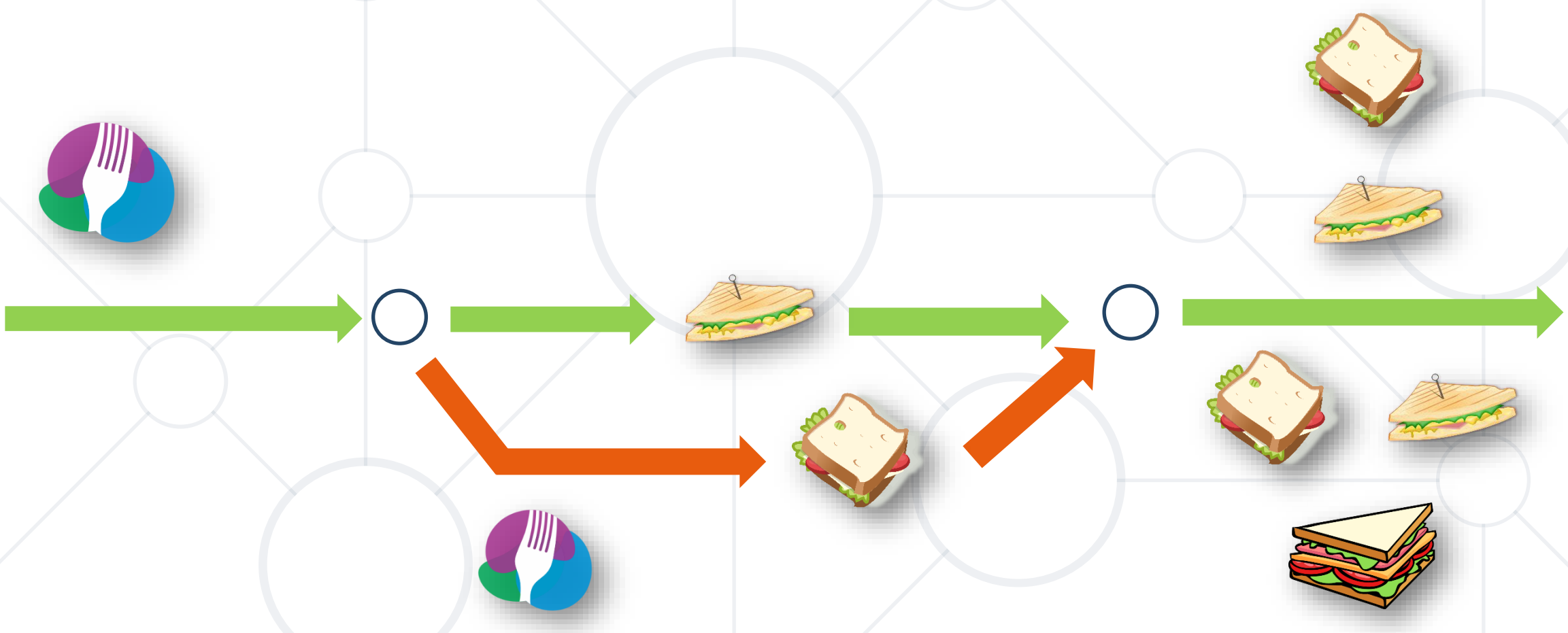


Vocabulary: Branch

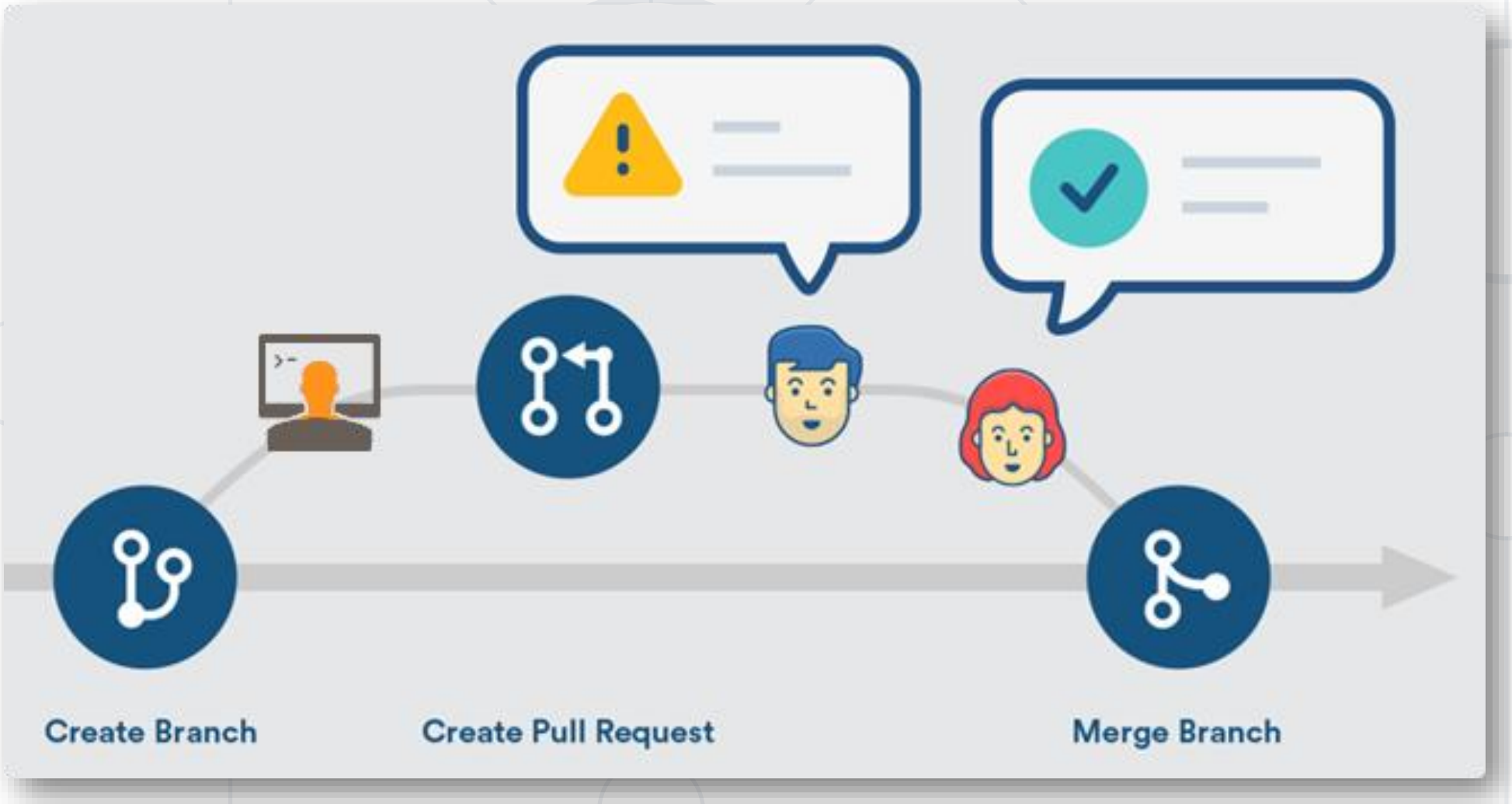
Vocabulary: Merge Branches



Example: Branches



Pull Requests: The Code Review Process



Git

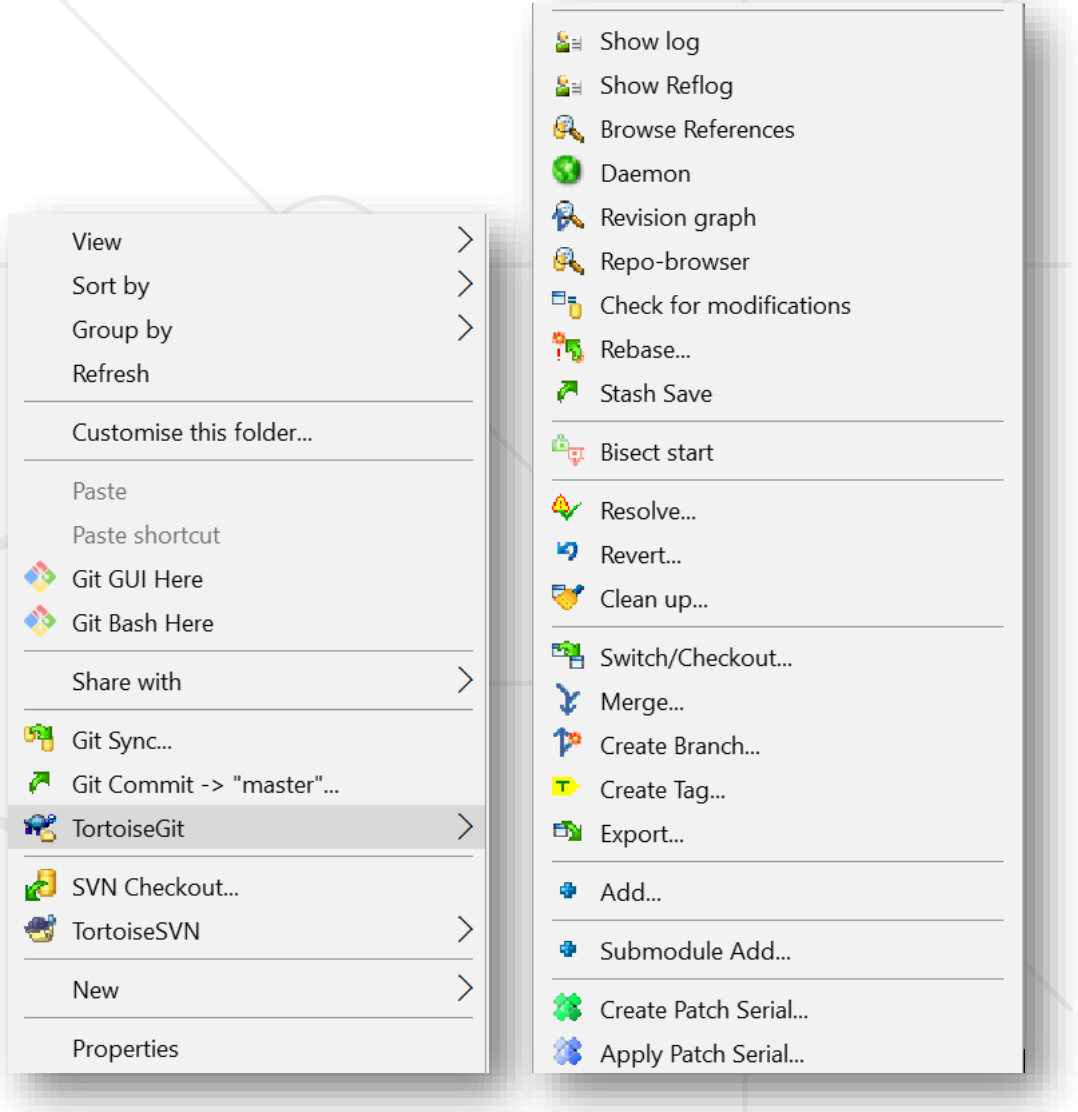
World's #1 Source Control System

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

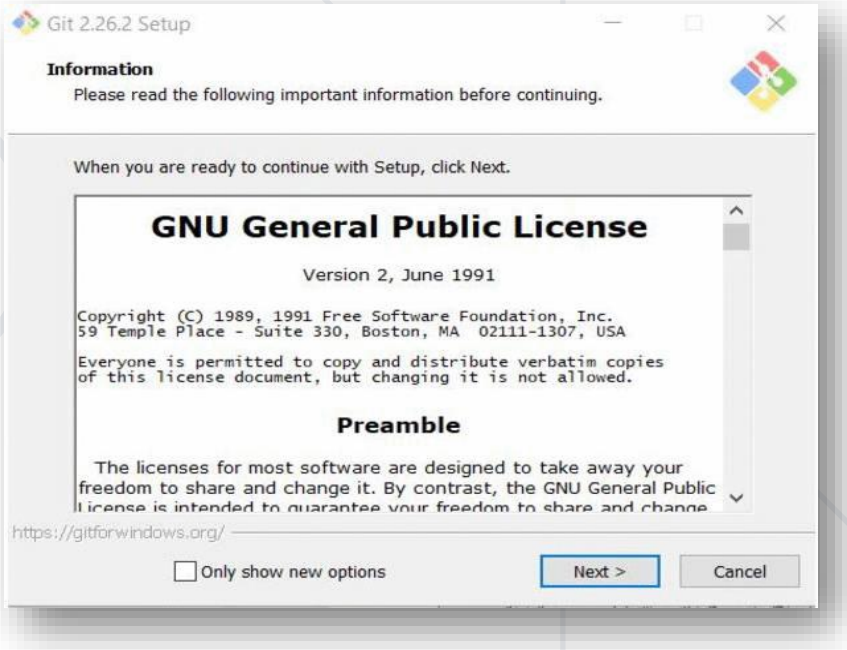
- Console-based Git client
  - **git, Git Bash**
- Windows GUI client – **TortoiseGit**
  - *https://tortoisegit.org/download*
- Visual Studio / Eclipse plug-ins
- **GitHub Desktop** client
  - *https://desktop.github.com*



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
```



Basic Git Commands

- 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]"
```

Basic Git Commands

- 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

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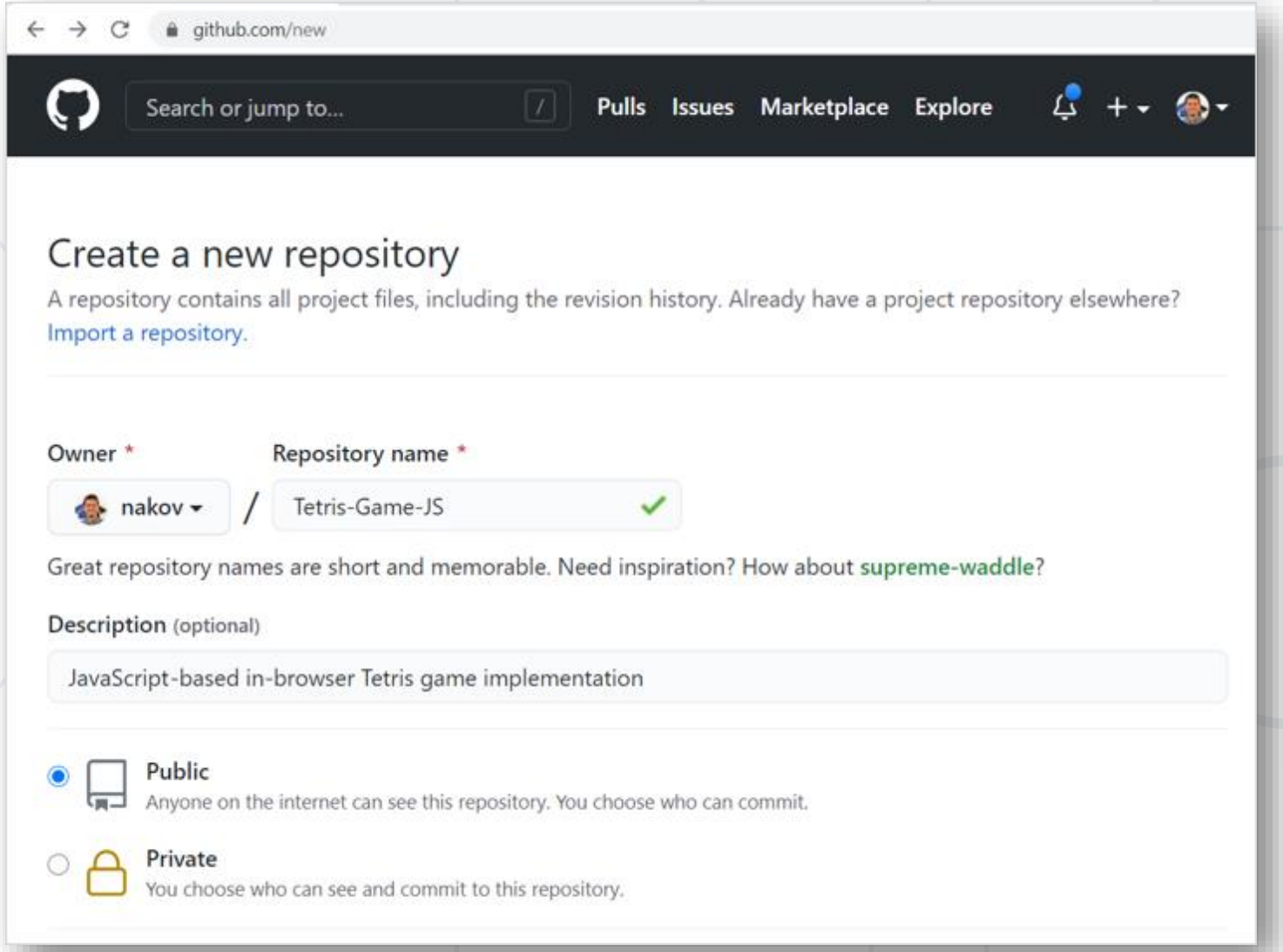

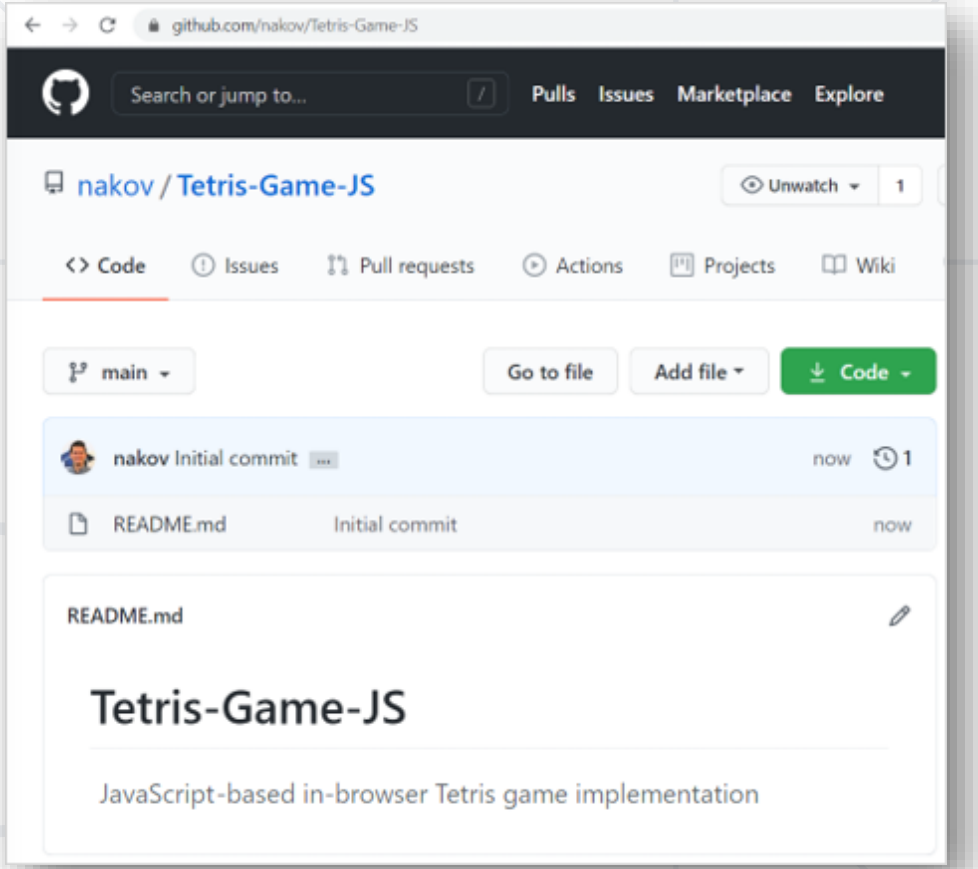

GitHub – Example

- **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
```

Summary

- 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