Version control tools

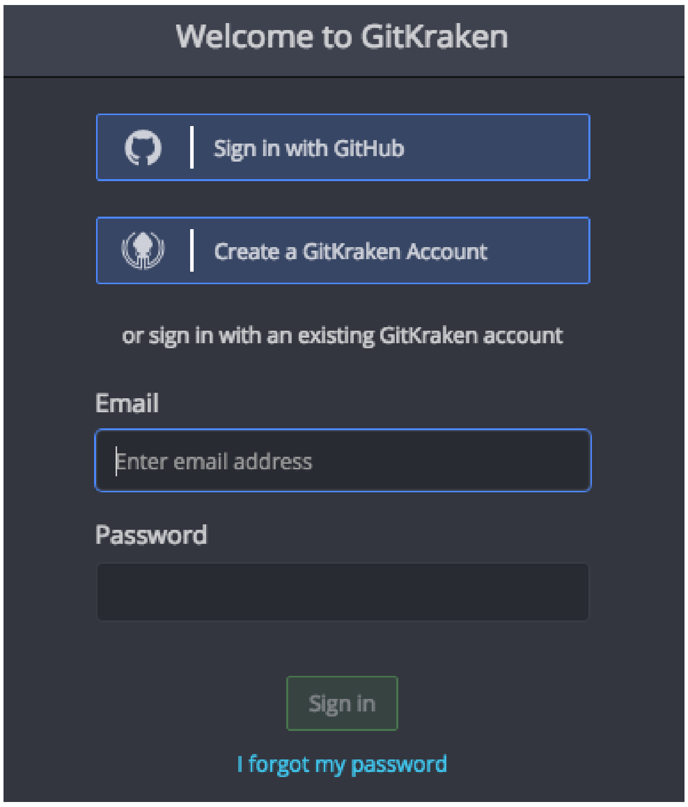
Using Git through IDEs

In this section we are going to learn how to use Git through some of the most popular IDEs and version control tools, so that we don't need to rely on the command line. But keep in mind that, in order to use all these applications, we MUST have Git installed in our system, following the steps provided in previous sections.

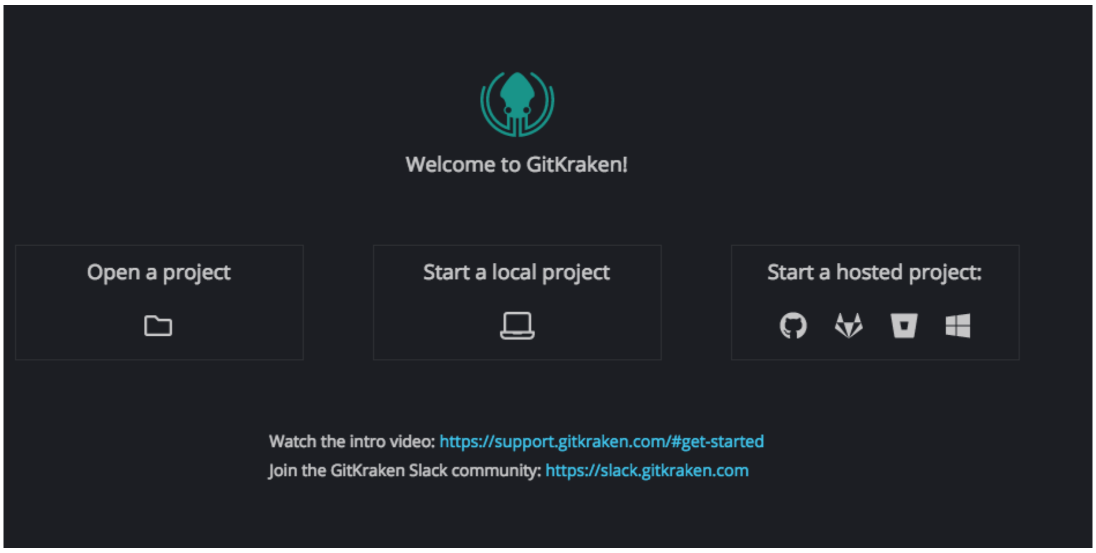
1. Git GUIs: GitKraken

First of all, let's talk about graphical user interfaces (GUI) that we can use to deal with Git commands. **GitKraken** is a free git tool that can be run under Windows, Linux or Mac OSX. It has also a commercial version, if we want to deal with private repositories, or we need some advanced features.

It can be downloaded from its official website. After the installation, we can start the application. The first time that we launch it, it will ask us to register, either with our GitHub account (if we already have one), or by creating our own GitKraken account. We can follow this option if we don't have any GitHub account, but if we sign up with GitHub, we can easily clone our GitHub repositories later. If we choose this option, then GitKraken will ask you to connect to GitHub from its main web site.

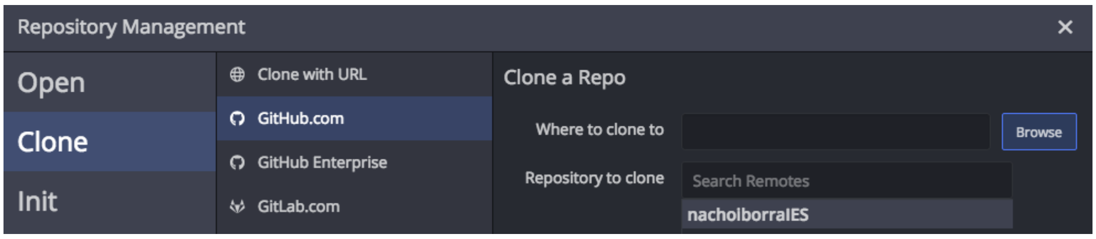


After singing up, we can see the welcome screen:

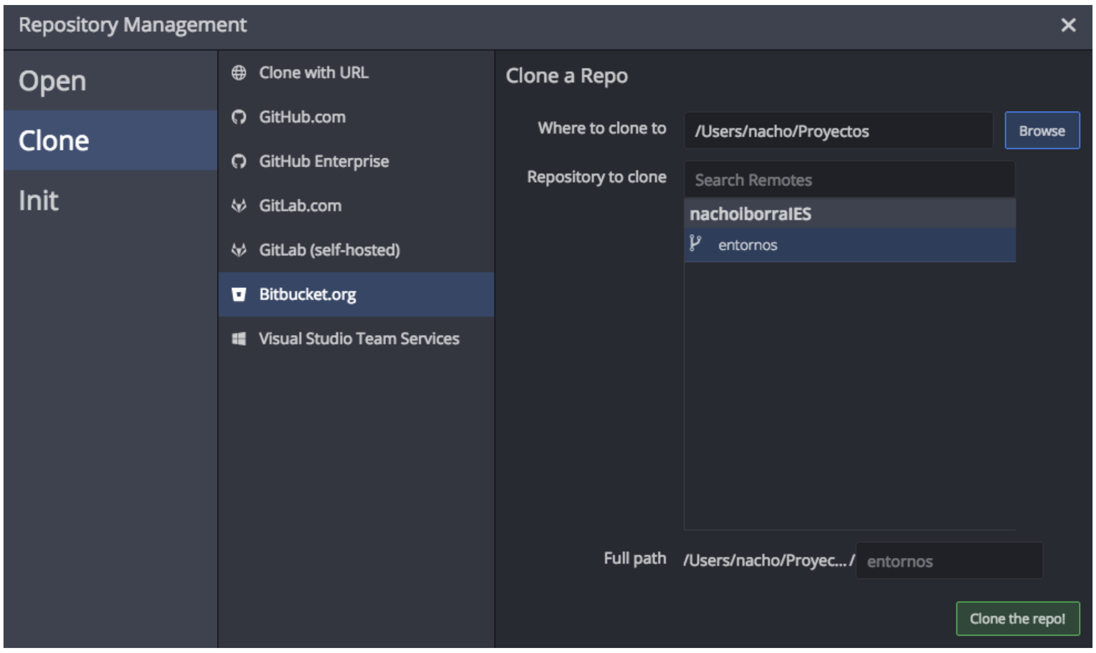

Welcome to GitKraken!
Open a project
Start a local project
Start a hosted project:
Watch the intro video: https://support.gitkraken.com/#get-started
Join the GitKraken Slack community: https://slack.gitkraken.com

- From the left option (*Open a project*) we can connect to a remote repository (from GitHub or Bitbucket, for instance), and download it.
- From the middle option (*Start a local project*) we can start a new, local project and create files on it. Then, we will be able to commit and upload the changes to a remote repository.
- From the right option (*Start a hosted project*) we can create a remote repository in one of the allowed platforms (GitHub, Bitbucket and some other), so that it connects to this repository and downloads it as well.

Let's assume that we have already created a remote repository, so we choose first option (*Open a project*). Then, we must choose the git platform to connect with. In our case, we choose GitHub, so we must click on the corresponding button.

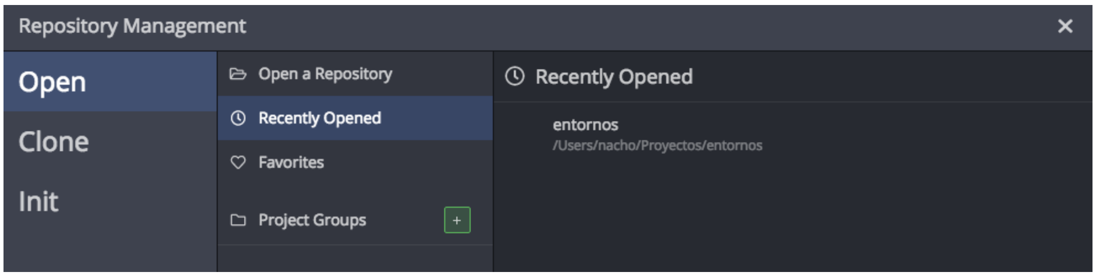


We must choose the repository to clone, and the folder where we want to download the project, in the right panel. Then, we can click on the *Clone the repo!* button in the bottom right corner.



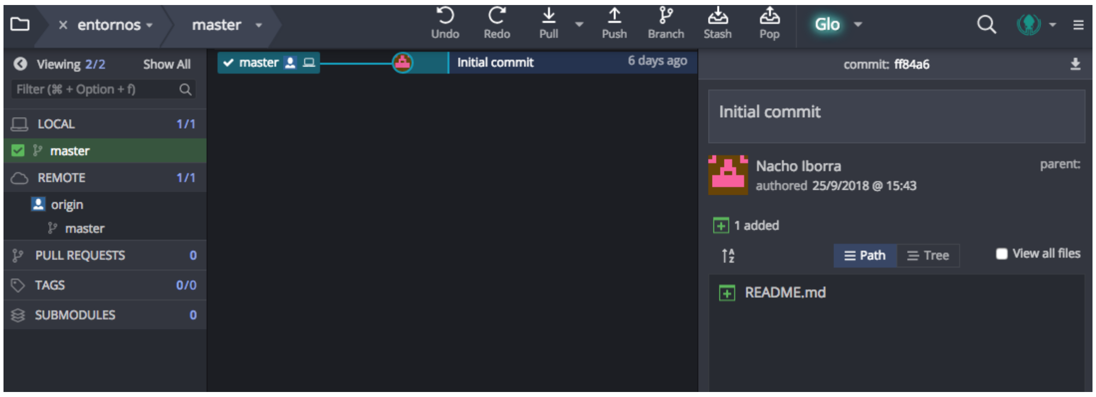
Where to clone to /Users/nacho/Proyectos
Repository to clone nacholborralES entornos
Full path /Users/nacho/Proyec.../ entornos

Once our repo is cloned, we can explore it from the *Open a project* option, or by clicking on the folder icon in the upper left corner of GitKraken window.



entornos
/Users/nacho/Proyectos/entornos

After choosing the project folder (or the project itself if we have opened it recently), we can see its contents:



master Initial commit 6 days ago

commit: ff84a6

Initial commit

Nacho Iborra
authored 25/9/2018 @ 15:43
parent:

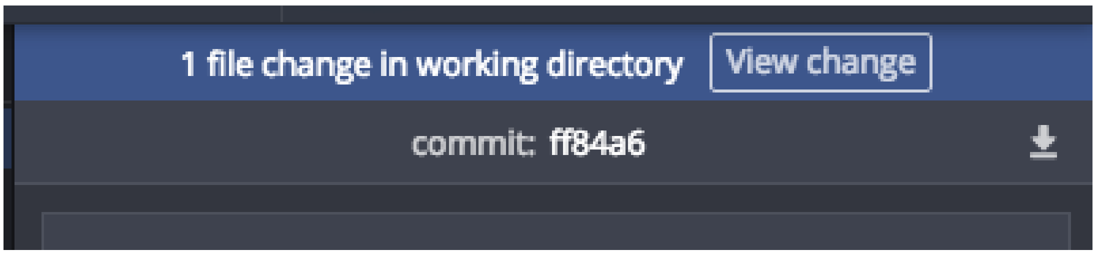
1 added

README.md

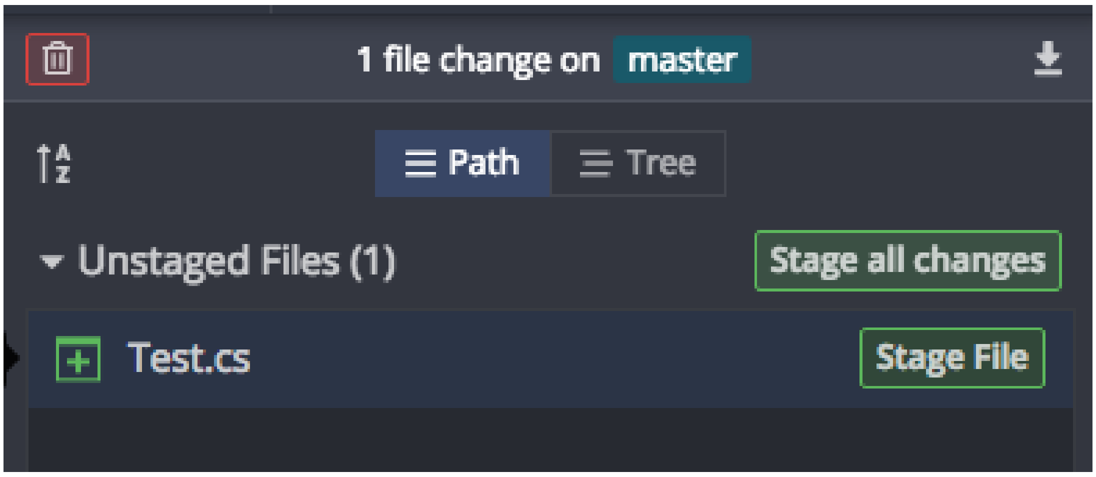
In the right panel we can see the project contents (files and folders). We can see them as paths or as a tree, by clicking on the corresponding buttons of this right part. In the middle panel we have the history of operations over the repository (commits and so on.). Finally, in the left panel we have a list of available branches.

1.1. Committing new changes

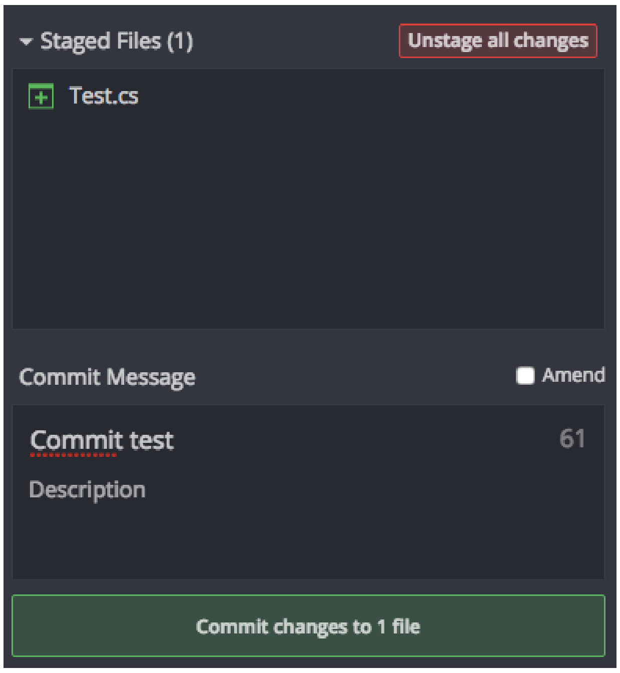
If we add new content to the project (or edit/remove existing content), then all the changes will be shown in the right panel automatically. For instance, if we add a new source file, we can see it this way:



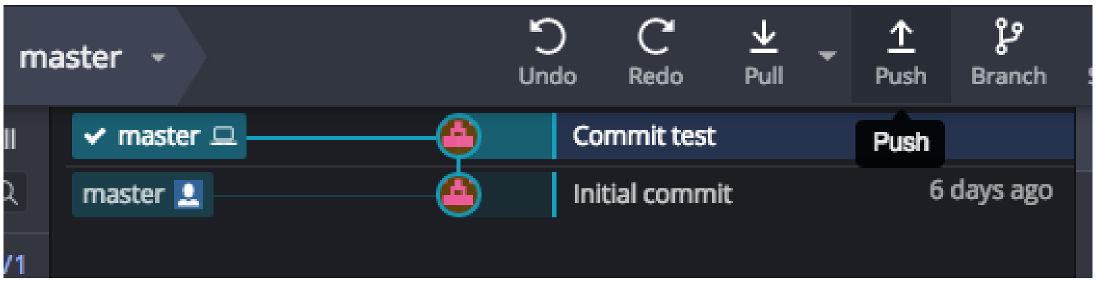
Then, we need to click on the *View Changes* button to see the file(s) that have changed. We can stage them individually (i.e. mark them to be committed in next commit operation), or stage all of them at once by clicking on the *Stage all changes* button.



Next step consists in committing the changes. We must add a commit comment (explaining what's new in this commit) and then click on *Commit changes* at the bottom.

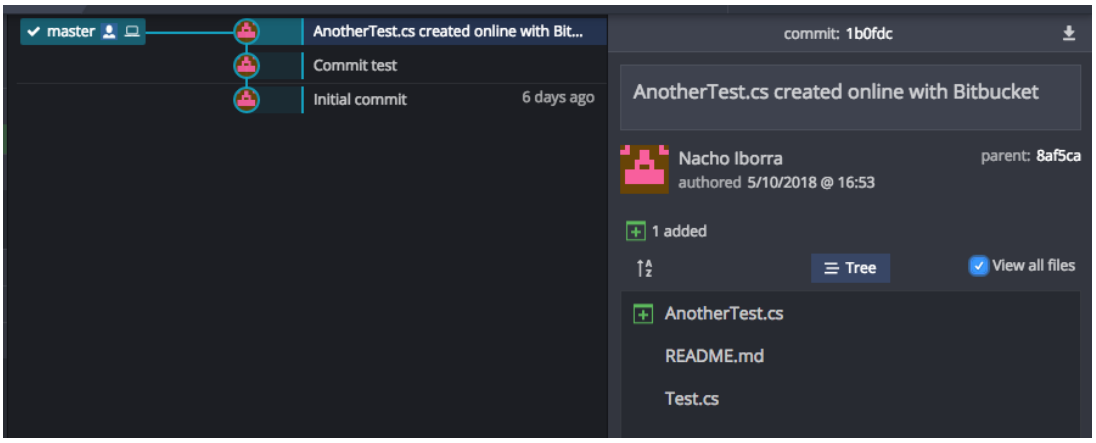


Finally, we need to push the changes to the remote repository. To do this, we go to the middle panel, choose the commit that we want to push and then click on the *Push* button in the upper toolbar.



1.2. Pulling new contents from the server

If we are working in a team, or if we just want to update the changes to another computer, we may need to pull the contents from the repository. For instance, if someone has uploaded new files to the repository (or changed existing files), we can click on the *Pull* button from the upper toolbar. Then, we can choose the corresponding commit in the list (middle panel) and then view all the affected files in the right panel.



1.3. Alternatives to GitKraken

There are some other Git tools that we can use instead of GitKraken to deal with GitHub or BitBucket repositories with a graphical environment. Here you can see some of them:

- SourceTree
- GitHub Desktop

These tools are available for Windows and MacOSX, but we can't use them under Linux systems. That's why we have talked about GitKraken instead.

> **Exercise 1**:
>
> Create a public repository called **CppPrograms** in your GitHub account. Clone it into a local folder using GitKraken. Then, copy the following program in a source file called *hello.cpp* inside that folder.

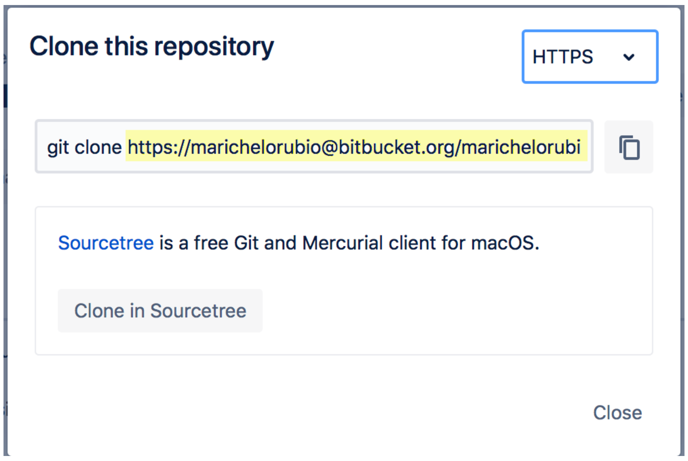
```
#include <iostream>

using namespace std;

int main()
{
    cout << "Hello world";
    return 0;
}
```

> Once you have finished copying the file, follow these steps:
>
> - Commit and push the changes to the remote repository.
> - Make some changes to previous source file. For instance, change the text that is being printed in the `cout` line. Then, make a second *commit* and its corresponding *push* to update the changes.
> - Optionally, you can share your project with a classmate, and ask him/her to update some of the files. Then, update these files in your local repository through a *pull* operation.

2. Using Git in Visual Studio Code

Most of current IDEs lets us use Git internally, so we can perform the main Git operations (commit, push, pull and so on) from the IDE itself. Let's see how it works with Visual Studio Code.

First of all, we must clone our remote repository. We open the command palette (`Control+Shift+P` , or `Cmd+Shift+P` in Mac systems) and we type "clone". Then we will see the `git clone` command, we select it and then we will be asked to enter the remote URL of the repository. We must paste there the URL of our remote GitHub or BitBucket repository (we can see it by clicking on the *Clone* button).


Clone this repository

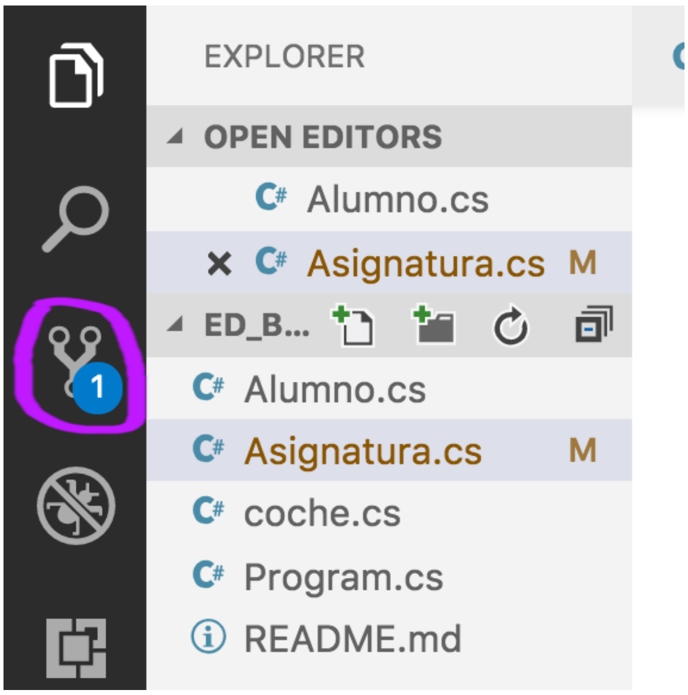
HTTPS

git clone https://marichelorubio@bitbucket.org/marichelorubi

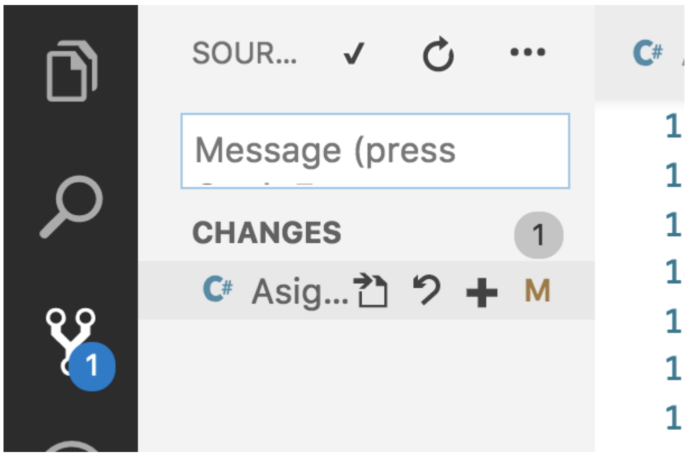
Sourcetree is a free Git and Mercurial client for macOS.

> **NOTE**: if `git clone` command is not recognized by VS Code, then you have not installed Git in your system properly (see previous sections of this course).

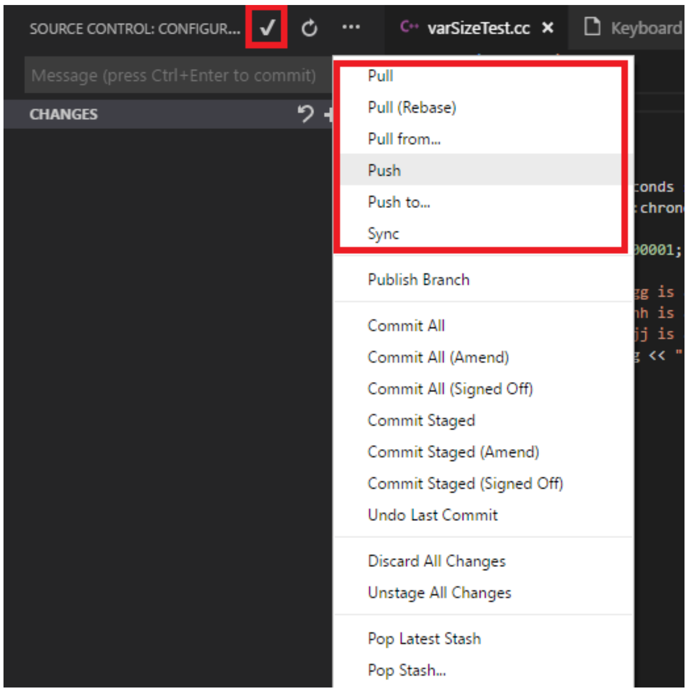
Then, we will see the repository files under Visual Studio Code, and if we make any change to any file, it will be automatically marked with an 'M' next to the file name. This means that the file has been modified from the last version uploaded to the repository. Then we can stage the file by clicking on the *Source Control* icon (see next image). This way, we can see the changes made and the Git options.



Regarding the options, we have *stage* (+), undo changes, *commit* (✓) and more general options in the upper menu.



If we want to push or pull the changes to/from the repository, we must click in the *more options* button (`...`) in the upper left toolbar, and choose the appropriate option.



Exercise 2:

Create a new public repository called **CppProgramsVSCode** in your GitHub account, and then clone it from VS Code. Then, repeat the steps made in Exercise 1 inside this new repository.

3. Using Git in IntelliJ

The integration of *IntelliJ* with Git repositories is really easy:

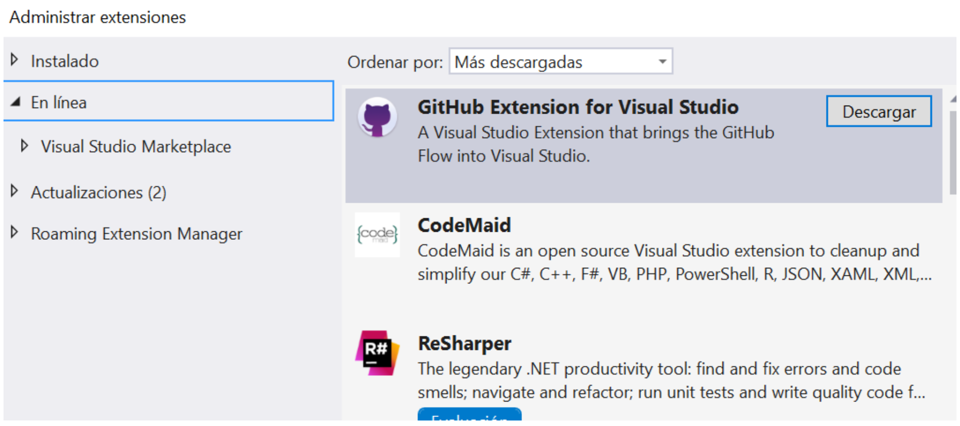
- If we want to **clone or download a remote repository** with an existing IntelliJ project to start working on it, we just go to *VCS > Get from Version Control* menu. Then, we can login in our GitHub account through the *GitHub* option on the left, and choose among our available repositories.
- If we want to **create a new, remote repository**, we must create the *IntelliJ* project first, and then choose *VCS > Share project on GitHub*. Then, we will be asked to choose the project name (and whether it's private or public) and the file(s) to be uploaded at the initial commit.
- Whenever we want to **commit** new changes, we choose *Git > Commit...* menu, and then choose which changes we want to commit, and the comment associated to this commit.
- If we want to **push** a commit, or **pull** the changes from the remote repository, we can find these options inside *Git* menu.

Exercise 3:

Create a new local Java project called **IntelliJGit**, and then share this project in your GitHub account. Then, add a new class called `Test`, and commit and push these changes.

4. Using Git in Visual Studio

Visual Studio has an option to deal with Git repositories. First of all, we may need to install GitHub extension for Visual Studio, from *Extensions > Manage extensions* menu:

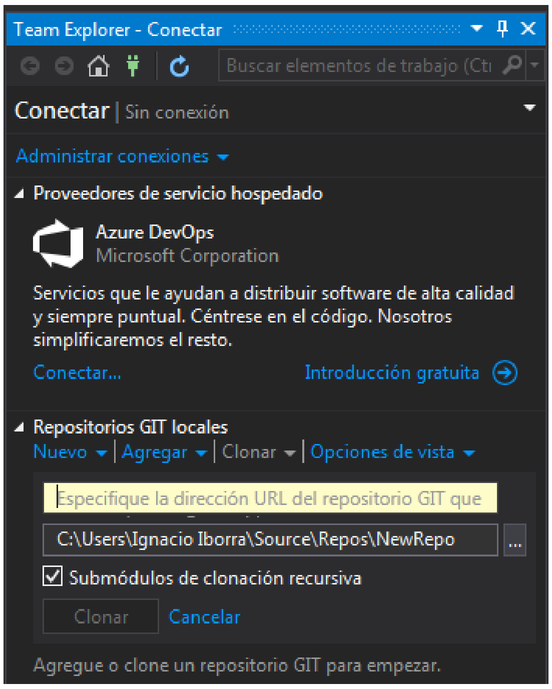

Administrar extensiones
Instalado
En línea
Visual Studio Marketplace
Actualizaciones (2)
Roaming Extension Manager
Ordenar por: Más descargadas
Descargar

GitHub Extension for Visual Studio
A Visual Studio Extension that brings the GitHub Flow into Visual Studio.

CodeMaid
CodeMaid is an open source Visual Studio extension to cleanup and simplify our C#, C++, F#, VB, PHP, PowerShell, R, JSON, XAML, XML,...

ReSharper
The legendary .NET productivity tool: find and fix errors and code smells; navigate and refactor; run unit tests and write quality code f...

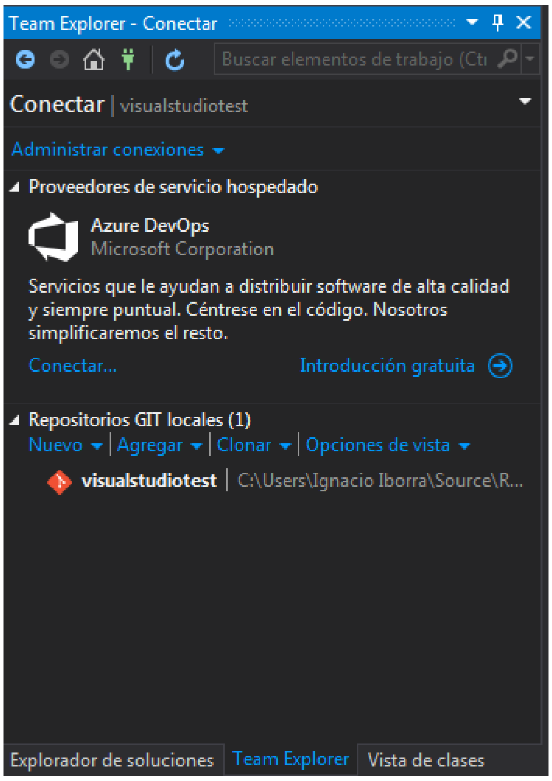
Then, if we want to communicate with a remote repository, we need to go to *Team > Manage connections* menu. The first time we choose this option, we will need to log in to GitHub to give some permissions to Visual Studio. Then, we can either create a local Git repository, or clone a remote one.


Team Explorer - Conectar
Buscar elementos de trabajo (Ctı
Conectar | Sin conexión
Administrar conexiones
Proveedores de servicio hospedado
Azure DevOps
Microsoft Corporation
Conectar...
Introducción gratuita
Repositorios GIT locales
Nuevo | Agregar | Clonar | Opciones de vista
Especifique la dirección URL del repositorio GIT que
C:\Users\Ignacio Iborra\Source\Repos\NewRepo
Submódulos de clonación recursiva
Clonar
Cancelar

Servicios que le ayudan a distribuir software de alta calidad y siempre puntual. Céntrese en el código. Nosotros simplificaremos el resto.

Agregue o clone un repositorio GIT para empezar.

If we choose the *Clone* option, we need to specify the remote URL to be cloned, and the local folder to download it. Then, we can add project(s) to this repository, and make changes. Everytime we want to upload these changes, we need to doubleclick on the repository:



Team Explorer - Conectar

Buscar elementos de trabajo (Ctı

Conectar | visualstudiotest

Administrar conexiones

Proveedores de servicio hospedado

Azure DevOps
Microsoft Corporation

Servicios que le ayudan a distribuir software de alta calidad y siempre puntual. Céntrese en el código. Nosotros simplificaremos el resto.

Conectar... Introducción gratuita

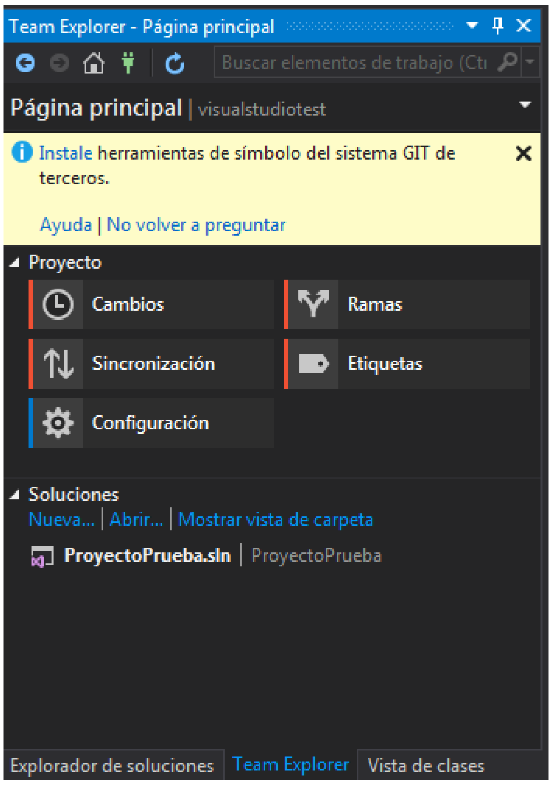
Repositorios GIT locales (1)

Nuevo | Agregar | Clonar | Opciones de vista

visualstudiotest | C:\Users\Ignacio Iborra\Source\R...

Explorador de soluciones | Team Explorer | Vista de clases

Then, we can click on the *Changes* option to see all the changes that are pending to be uploaded. We can add a comment for all of them and confirm the commit:



Team Explorer - Página principal

Buscar elementos de trabajo (Ctı

Página principal | visualstudiotest

Instale herramientas de símbolo del sistema GIT de terceros.

Ayuda | No volver a preguntar

Proyecto

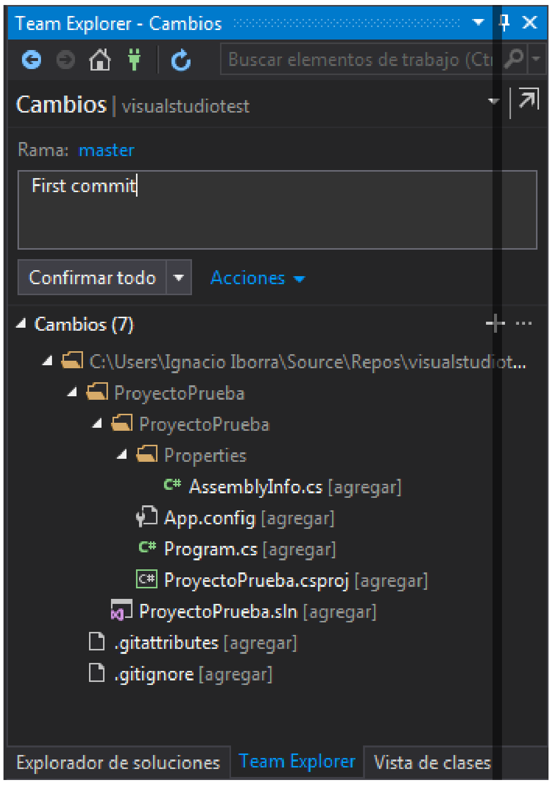
Cambios | Ramas
Sincronización | Etiquetas
Configuración

Soluciones

Nueva... | Abrir... | Mostrar vista de carpeta

ProyectoPrueba.sln | ProyectoPrueba

Explorador de soluciones | Team Explorer | Vista de clases



Team Explorer - Cambios

Buscar elementos de trabajo (Ctı

Cambios | visualstudiotest

Rama: master

First commit

Confirmar todo | Acciones

Cambios (7)

```
C:\Users\Ignacio Iborra\Source\Repos\visualstudiot...
  ProyectoPrueba
    ProyectoPrueba
      Properties
        AssemblyInfo.cs [agregar]
      App.config [agregar]
      Program.cs [agregar]
      ProyectoPrueba.csproj [agregar]
    ProyectoPrueba.sln [agregar]
  .gitattributes [agregar]
  .gitignore [agregar]
```

Explorador de soluciones | Team Explorer | Vista de clases

Finally we need to choose the *Synchronize* option to upload (*push*) the changes to the remote repository. We may be asked to enter our credentials to let us push the contents.

We can also use this option at the beginning of our session, to download (*pull*) the updated contents from the remote repository, so that we can make our changes and upload them from a previously updated version.

> **Exercise 4:**
>
> Create a new remote repository in your GitHub account called **VisualStudioTest**. Clone it in Visual Studio, add a new project on it and upload the changes from Visual Studio to the remote repository.