00 – Virtual Env + GIT

Data Science and Management

Corso di Laurea Magistrale in Ingegneria Gestionale

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- Virtual Environment + PIP
- GIT

Virtual Environment

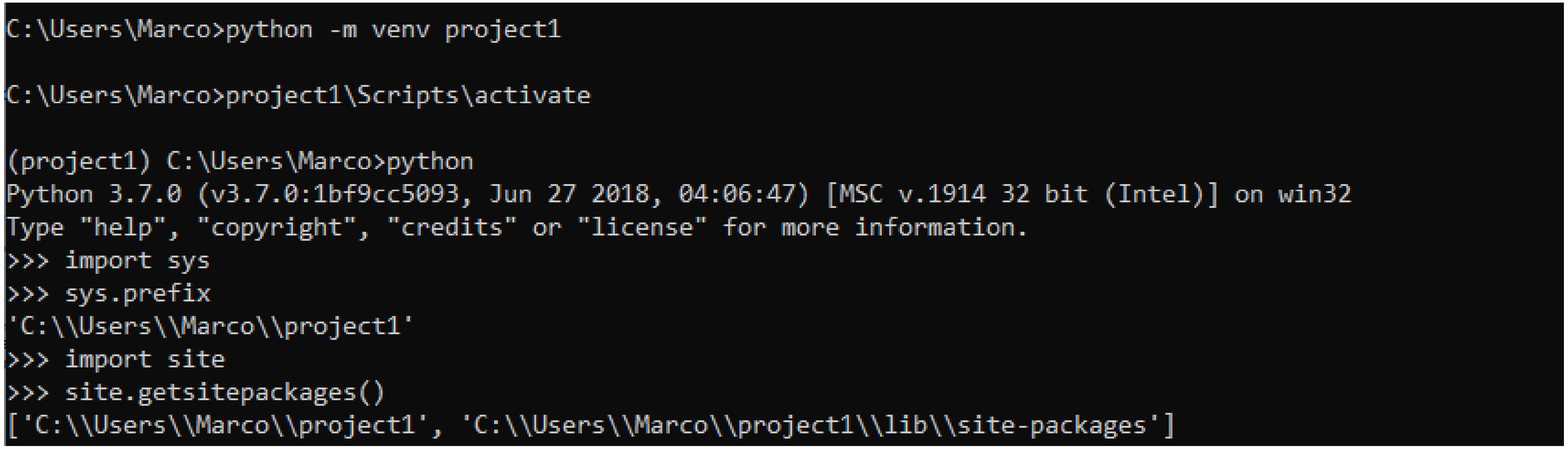
- By default, every project on your system will use these same directories to store and retrieve site packages (third party libraries). This is not a big problem for system packages (packages that are part of the standard Python library), but it does matter for site packages.

- Consider the following scenario where you have two projects: ProjectA and ProjectB, both of which have a dependency on the same library, ProjectC. The problem becomes apparent when we start requiring different versions of ProjectC. Maybe ProjectA needs v1.0.0, while ProjectB requires the newer v2.0.0.

- This is a real problem for Python since it can’t differentiate between versions in the site-packages directory. So both v1.0.0 and v2.0.0 would reside in the same directory with the same name

What Is a Virtual Environment?

- The main purpose of Python virtual environments is to create an isolated environment for Python projects. This means that each project can have its own dependencies, regardless of what dependencies every other project has.



```
C:\Users\Marco>python -m venv project1

C:\Users\Marco>project1\Scripts\activate

(project1) C:\Users\Marco>python
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> import sys
>>> sys.prefix
'C:\\Users\\Marco\\project1'
>>> import site
>>> site.getsitepackages()
['C:\\Users\\Marco\\project1', 'C:\\Users\\Marco\\project1\\lib\\site-packages']
```

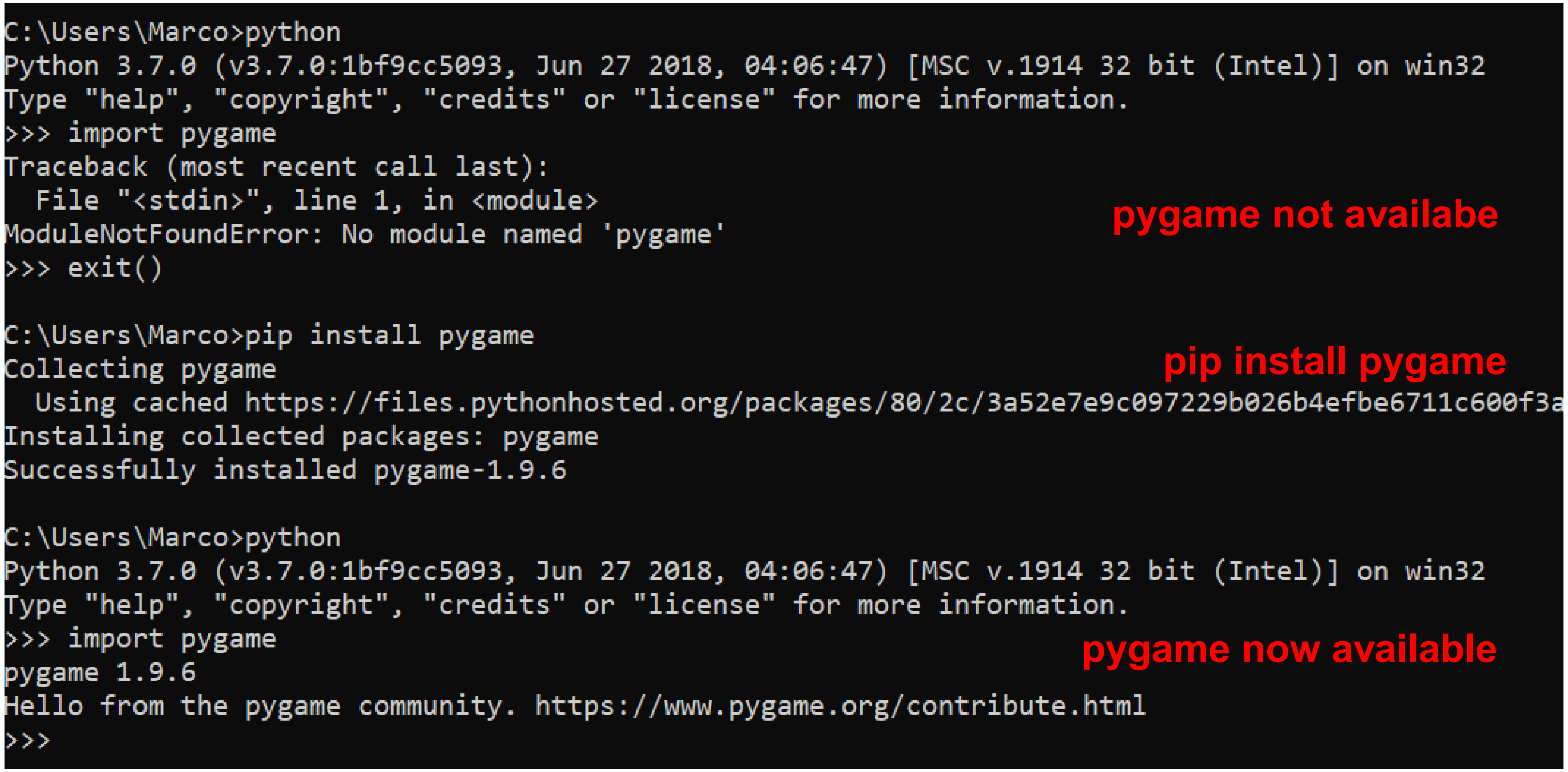
PIP

- Python Package Index (PyPI) è un repository che contiene decine di migliaia di package scritti in Python.
    - GUI, Videogame, Applicazioni Web, Calcolo Scientifico, AI,….

- È possibile accedere ai package del Python Package Index tramite un tool chiamato **pip** (anche integrato in pycharm)

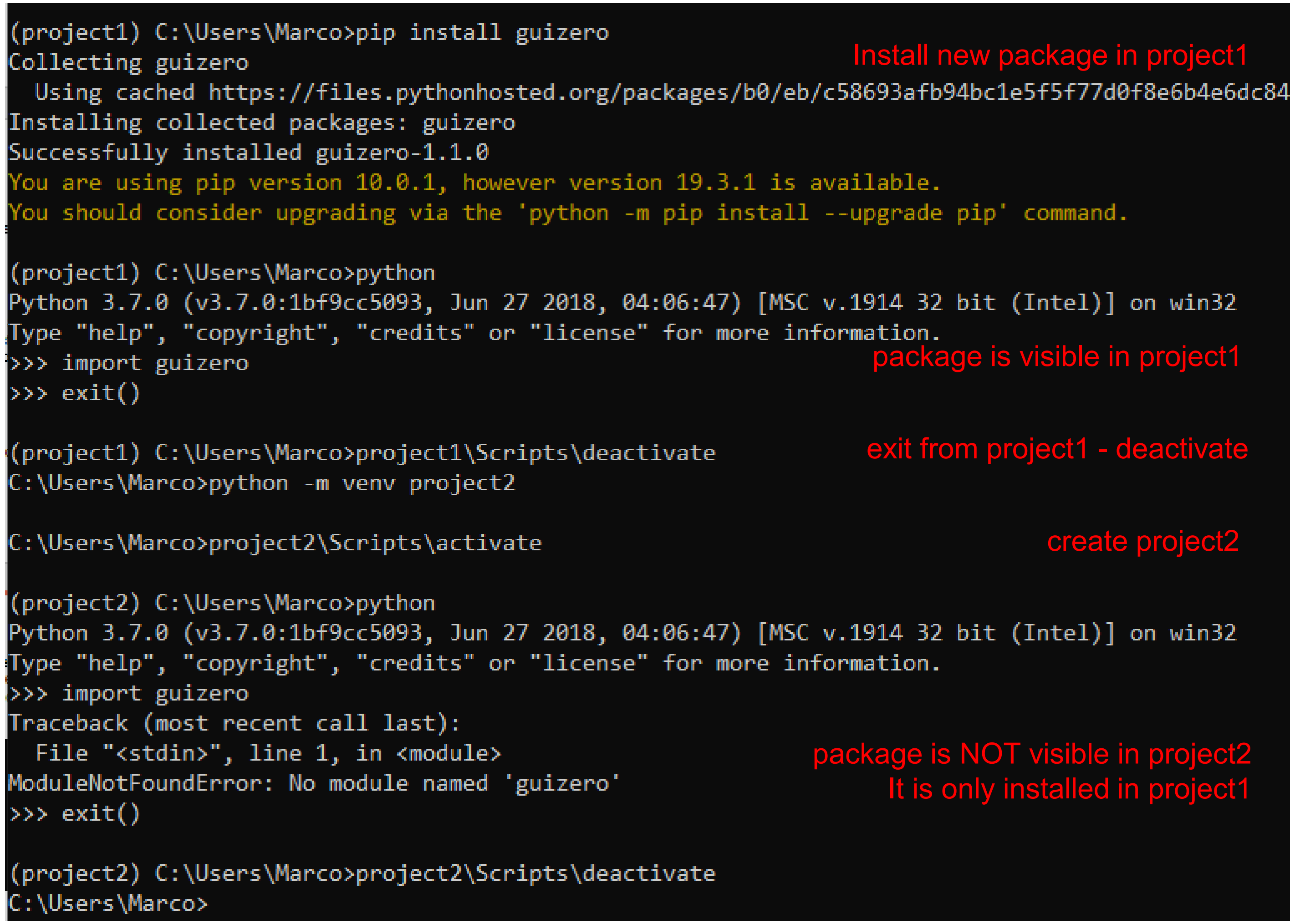
- **pip** è un tool che ci permette di cercare, scaricare ed installare package Python che si trovano sul Python Package Index. pip ci consente inoltre di gestire i package che abbiamo già scaricato, permettendonci di aggiornarli o rimuoverli.

PIP



```
C:\Users\Marco>python
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> import pygame
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
ModuleNotFoundError: No module named 'pygame'
>>> exit()

C:\Users\Marco>pip install pygame
Collecting pygame
  Using cached https://files.pythonhosted.org/packages/80/2c/3a52e7e9c097229b026b4efbe6711c600f3a
Installing collected packages: pygame
Successfully installed pygame-1.9.6

C:\Users\Marco>python
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> import pygame
pygame 1.9.6
Hello from the pygame community. https://www.pygame.org/contribute.html
>>>
```

What Is a Virtual Environment?

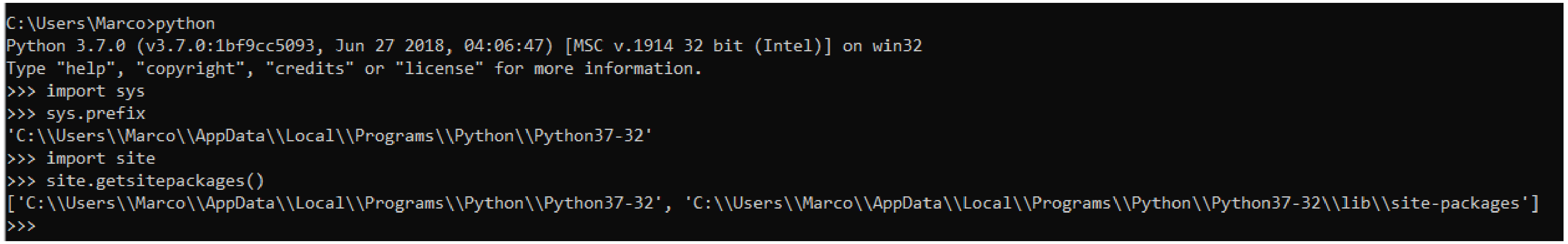


```
(project1) C:\Users\Marco>pip install guizero
Collecting guizero
  Using cached https://files.pythonhosted.org/packages/b0/eb/c58693afb94bc1e5f5f77d0f8e6b4e6dc84
Installing collected packages: guizero
Successfully installed guizero-1.1.0
You are using pip version 10.0.1, however version 19.3.1 is available.
You should consider upgrading via the 'python -m pip install --upgrade pip' command.

(project1) C:\Users\Marco>python
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> import guizero
>>> exit()

(project1) C:\Users\Marco>project1\Scripts\deactivate
C:\Users\Marco>python -m venv project2

C:\Users\Marco>project2\Scripts\activate

(project2) C:\Users\Marco>python
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> import guizero
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
ModuleNotFoundError: No module named 'guizero'
>>> exit()

(project2) C:\Users\Marco>project2\Scripts\deactivate
C:\Users\Marco>
```

Install new package in project1
package is visible in project1
exit from project1 - deactivate
create project2
package is NOT visible in project2
It is only installed in project1

Virtual Environment

- Where does Python installs modules?



```
C:\Users\Marco>python
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> import sys
>>> sys.prefix
'C:\\Users\\Marco\\AppData\\Local\\Programs\\Python\\Python37-32'
>>> import site
>>> site.getsitepackages()
['C:\\Users\\Marco\\AppData\\Local\\Programs\\Python\\Python37-32', 'C:\\Users\\Marco\\AppData\\Local\\Programs\\Python\\Python37-32\\lib\\site-packages']
>>>
```

Git

Git is a popular version control system.

It is used for:

- **Tracking code changes**
- **Tracking who made changes**
- **Coding collaboration**

It allows to

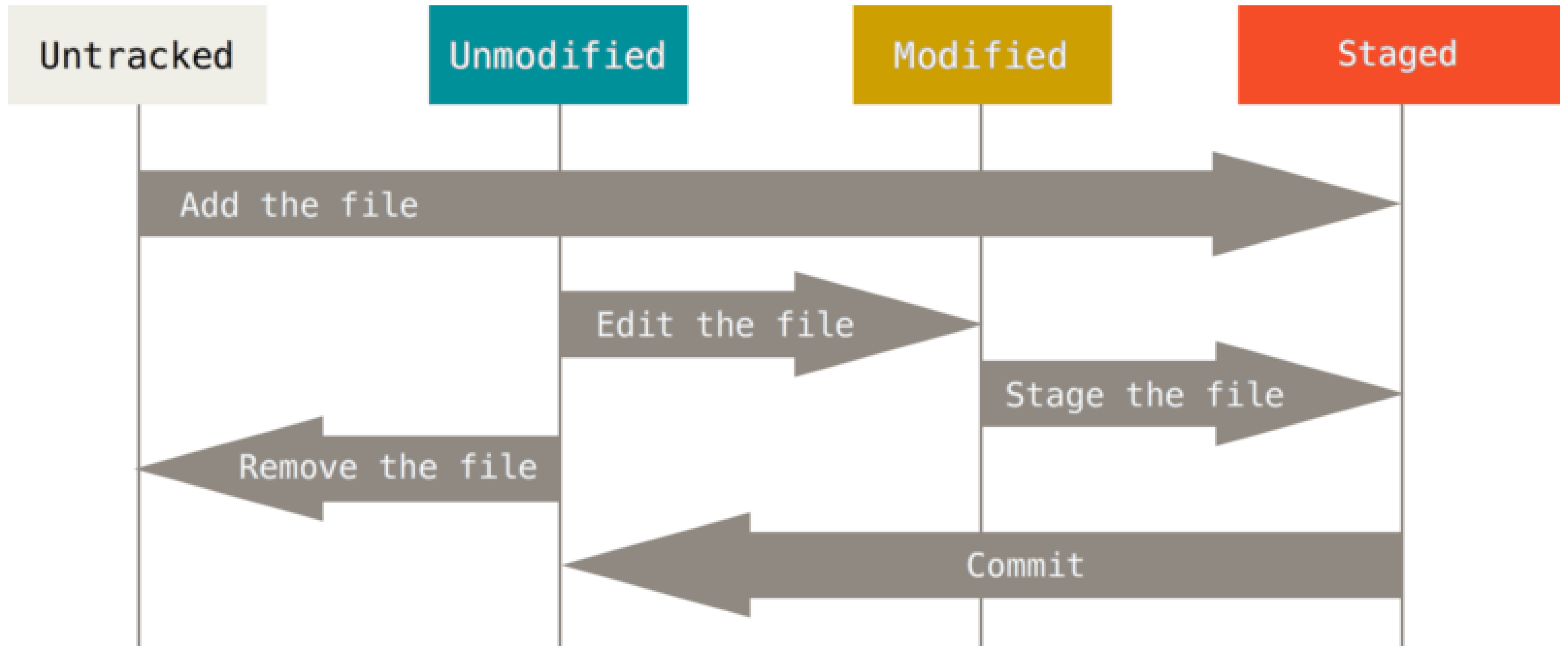
- Manage projects with **Repositories**
- **Clone** a project to work on a local copy
- Control and track changes with **Staging** and **Committing**
- **Branch** and **Merge** to allow for work on different parts and versions of a project
- **Pull** the latest version of the project to a local copy
- **Push** local updates to the main project

Working with Git

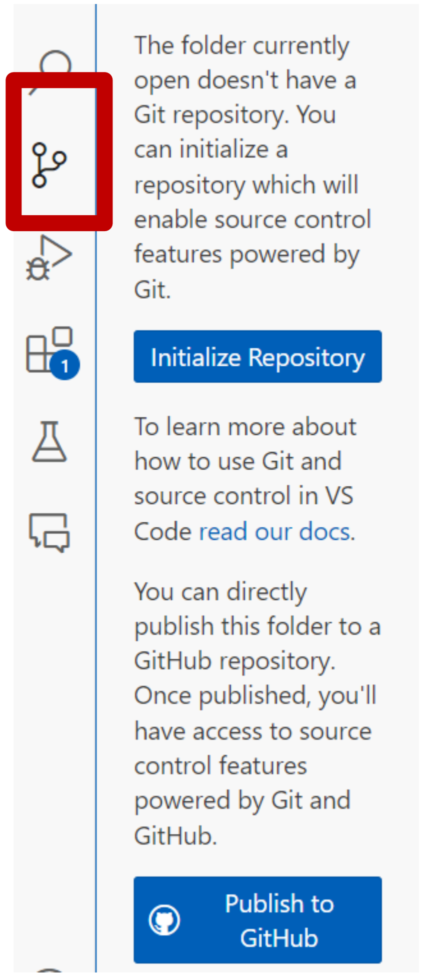
- Initialize Git on a folder, making it a **Repository**
- Git now creates a hidden folder to keep track of changes in that folder
- When a file is changed, added or deleted, it is considered **modified**
- You select the modified files you want to **Stage**
- The **Staged** files are **Committed**, which prompts Git to store a **permanent** snapshot of the files
- Git allows you to see the full history of every commit.
- You can revert back to any previous commit.

Git Commands

- The lifecycle of the status of your files



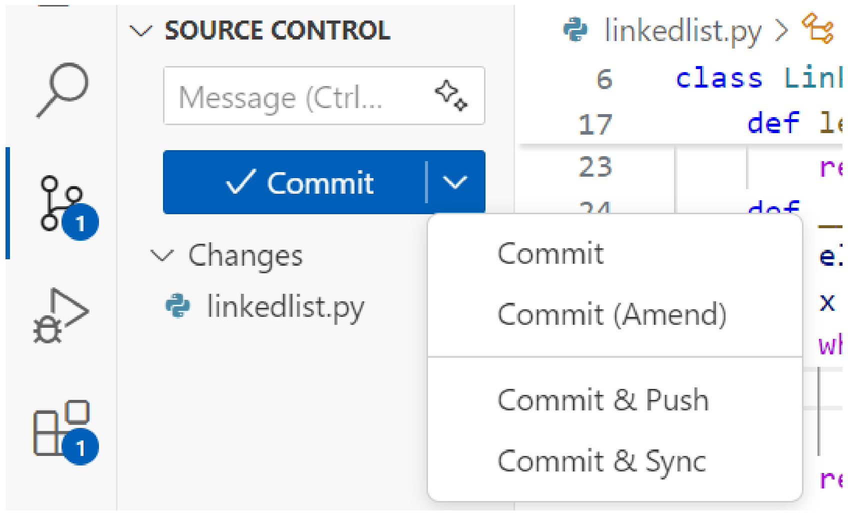
Git Commands (VSCode)

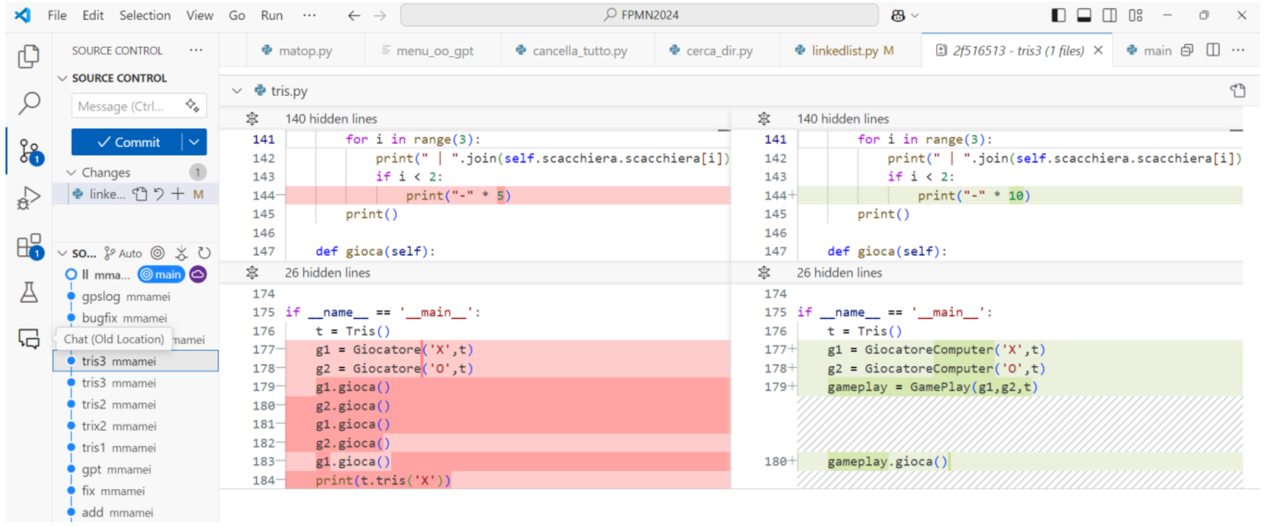


The folder currently open doesn't have a Git repository. You can initialize a repository which will enable source control features powered by Git.

To learn more about how to use Git and source control in VS Code read our docs.

You can directly publish this folder to a GitHub repository. Once published, you'll have access to source control features powered by Git and GitHub.

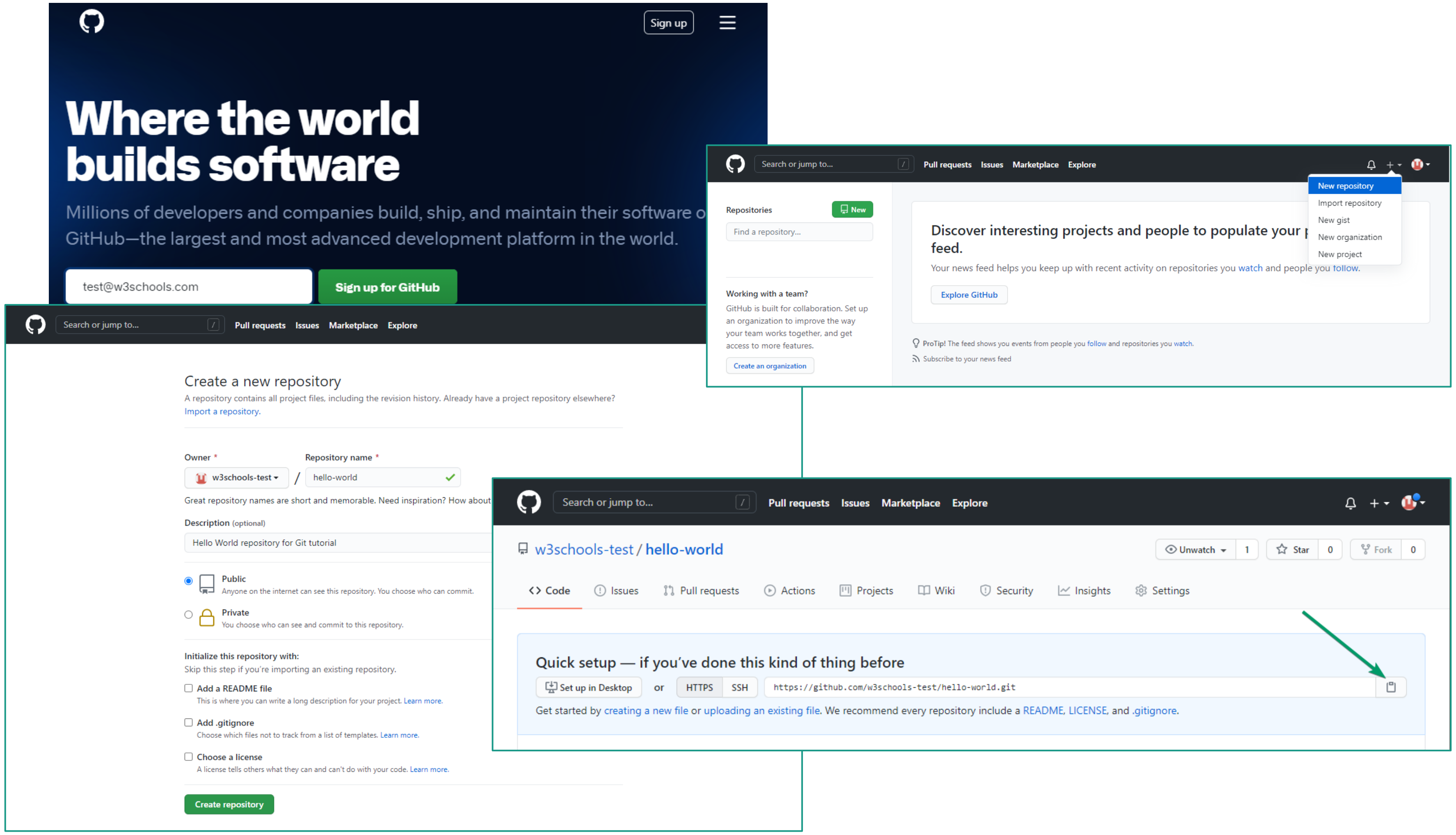




```
        for i in range(3):
            print(" | ".join(self.scacchiera.scacchiera[i]))
            if i < 2:
                print("-" * 5)
        print()

    def gioca(self):

if __name__ == '__main__':
    t = Tris()
    g1 = Giocatore('X',t)
    g2 = Giocatore('O',t)
    g1.gioca()
    g2.gioca()
    g1.gioca()
    g2.gioca()
    g1.gioca()
    print(t.tris('X'))
```

```
        for i in range(3):
            print(" | ".join(self.scacchiera.scacchiera[i]))
            if i < 2:
                print("-" * 10)
        print()

    def gioca(self):

if __name__ == '__main__':
    t = Tris()
    g1 = GiocatoreComputer('X',t)
    g2 = GiocatoreComputer('O',t)
    gameplay = GamePlay(g1,g2,t)

    gameplay.gioca()
```

GitHub



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ProTip! The feed shows you events from people you follow and repositories you watch.

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Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? Import a repository.

Owner * w3schools-test / Repository name * hello-world

Great repository names are short and memorable. Need inspiration? How about

Description (optional)
Hello World repository for Git tutorial

[✓ 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.

Initialize this repository with:
Skip this step if you're importing an existing repository.

- [ ] Add a README file
  This is where you can write a long description for your project. Learn more.
- [ ] Add .gitignore
  Choose which files not to track from a list of templates. Learn more.
- [ ] Choose a license
  A license tells others what they can and can't do with your code. Learn more.

Create repository

w3schools-test / hello-world

Unwatch 1 Star 0 Fork 0

Code Issues Pull requests Actions Projects Wiki Security Insights Settings

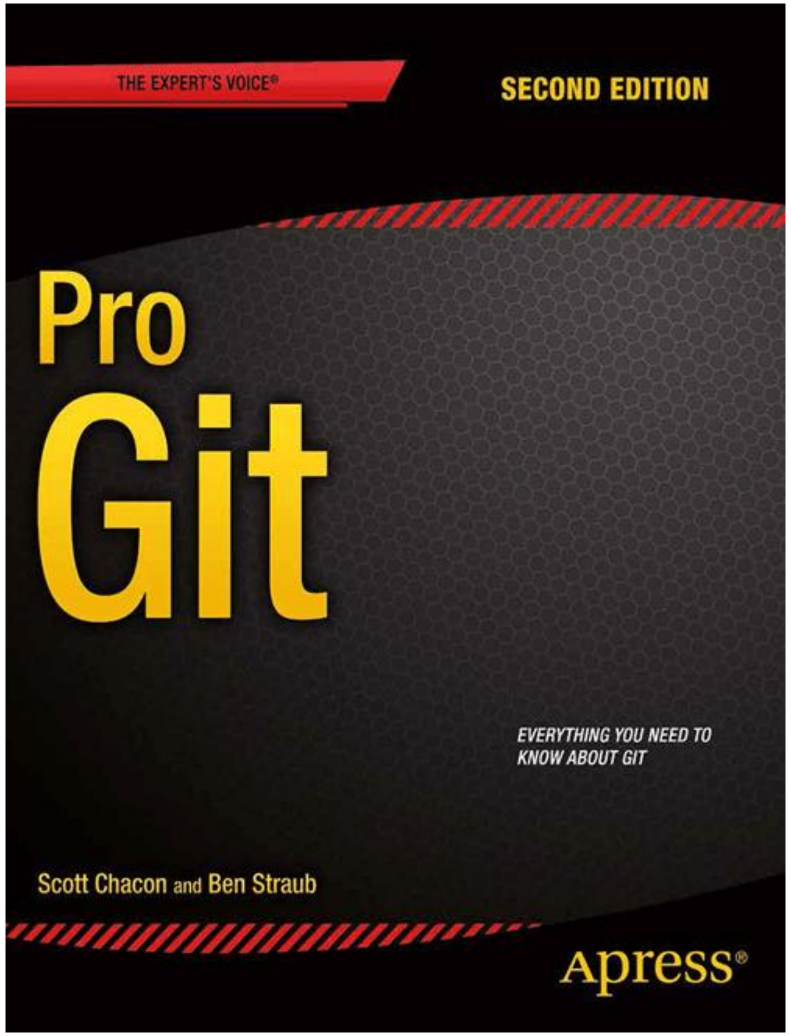
Quick setup — if you've done this kind of thing before

Set up in Desktop or HTTPS SSH `https://github.com/w3schools-test/hello-world.git`

Get started by creating a new file or uploading an existing file. We recommend every repository include a README, LICENSE, and .gitignore.

Further Resources

- https://git-scm.com/book/en/v2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