Practice 0

Sofware Development Frameworks

ETSID

Título de Grado en Electrónica Industrial y Automática

Escuela Técnica Superior de Ingeniería del Diseño

DSIC

DEPARTAMENTO DE SISTEMAS INFORMÁTICOS Y COMPUTACIÓN

Objetives

- At the end of this lesson, students should be able to properly:

1. Define Version Control System (VCS) concept.
2. Manage (ex. create, commit, push, issues etc…) software repositories using VCS Github.
3. Define Interface Development Enterprise (IDE) concept.
4. Manage (write source code, compile, debug and execute etc…) implementation process using IDE DevC++.

Índex

- **Software development process**
- Version Control system
  - GitHub
    - Registration
    - Your first repository (arapractice00face)
  - GitHub Desktop
    - Installation & Configuration
    - Your first local repository (practice00face clone)
- Integrated Development Environment
  - Devc++ IDE Framework
    - Installatatiom & Configuration
- Practice 00 Face
- Practice 01 Face
- Practice 01 Autonomous (to do at home)

Software development process

- Phases of software development
  - Definition problem.
  - ***Algorithm Design.***
    - **Flowchar or pseudocode.**
  - ***Implementation.***
    - **Framework Dev C++ IDE.**
  - *Execution and validation of the program*
    - **GitHub + Jenkins Frameworks.**
  - Documentation.
  - Maintenance of the program. In this phase the programs are updated (creating new versions) if new functionalities are required or problems are detected.

DevC++

GitHub

Índex

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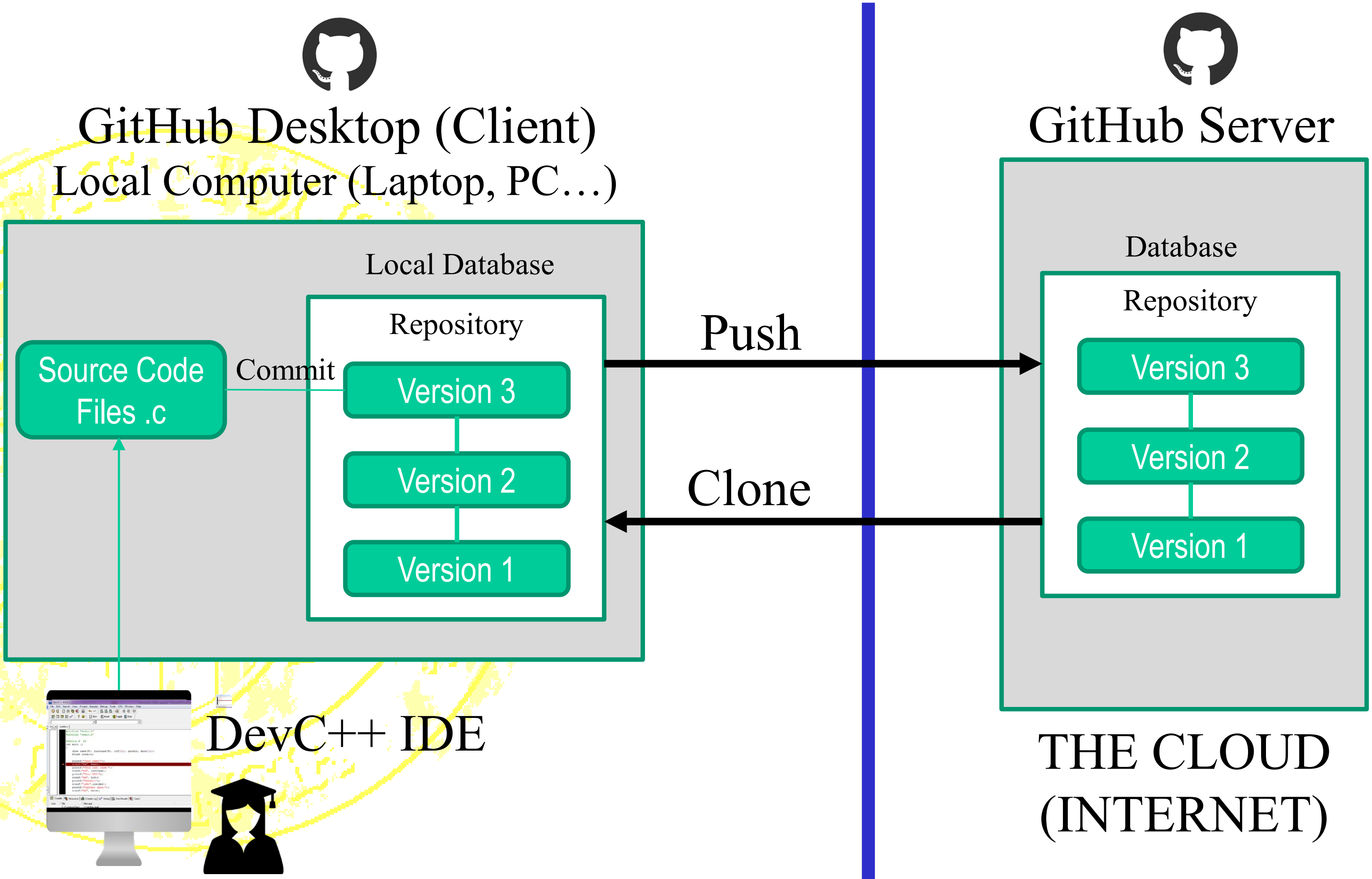
Version Control System

- A Version Control System (VCS) is a software configuration management of computer programs.
    - When a program is finished without errors are usually identified by a number or letter code (ex. Version 1).
    - When the first change is made, the resulting set is a new version (ex. Version 2), and so on.
    - Each revision is associated with a timestamp and the person making the change. Revisions can be compared, restored etc.…
- There are a lot of VCS, the most common are the follow:
    - Apache Subversion, Microsoft Visual SourceSafe, **Git** …
- **We are going to use GitHub,** which is a framework that implement Git VCS.

Version Control System

GitHub Arquitecture



GitHub Desktop (Client)

Local Computer (Laptop, PC…)

Local Database

Repository

Source Code Files .c

Commit

Version 3

Version 2

Version 1

Push

Clone

GitHub Server

Database

Repository

Version 3

Version 2

Version 1

DevC++ IDE

THE CLOUD (INTERNET)

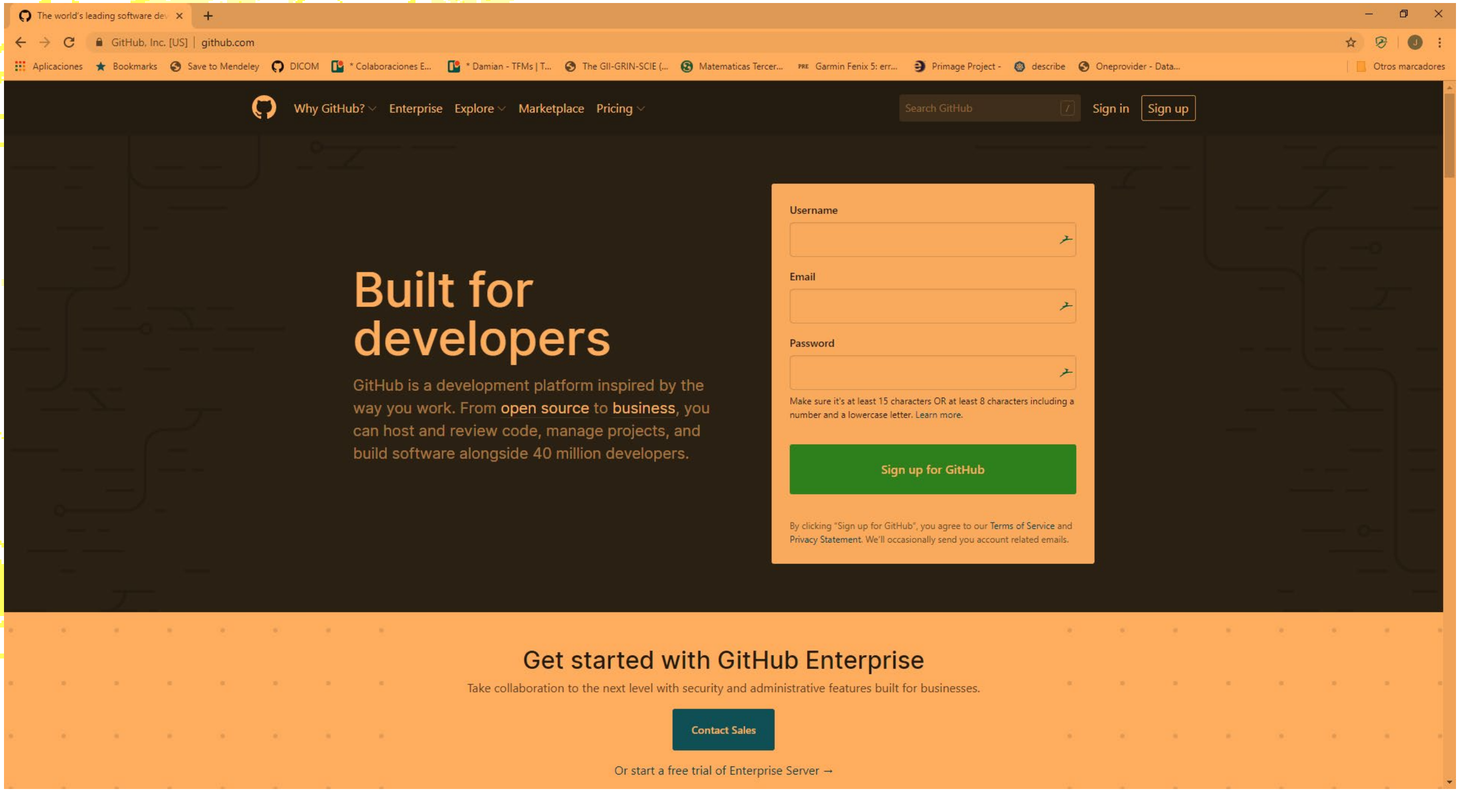
Version Control System

GitHub - Registration

- **To register to GitHub, you should:**

  Step 1. Entry to this address:

  https://github.com/



Built for developers

GitHub is a development platform inspired by the way you work. From open source to business, you can host and review code, manage projects, and build software alongside 40 million developers.

Username

Email

Password

Make sure it's at least 15 characters OR at least 8 characters including a number and a lowercase letter. Learn more.

By clicking "Sign up for GitHub", you agree to our Terms of Service and Privacy Statement. We'll occasionally send you account related emails.

Get started with GitHub Enterprise

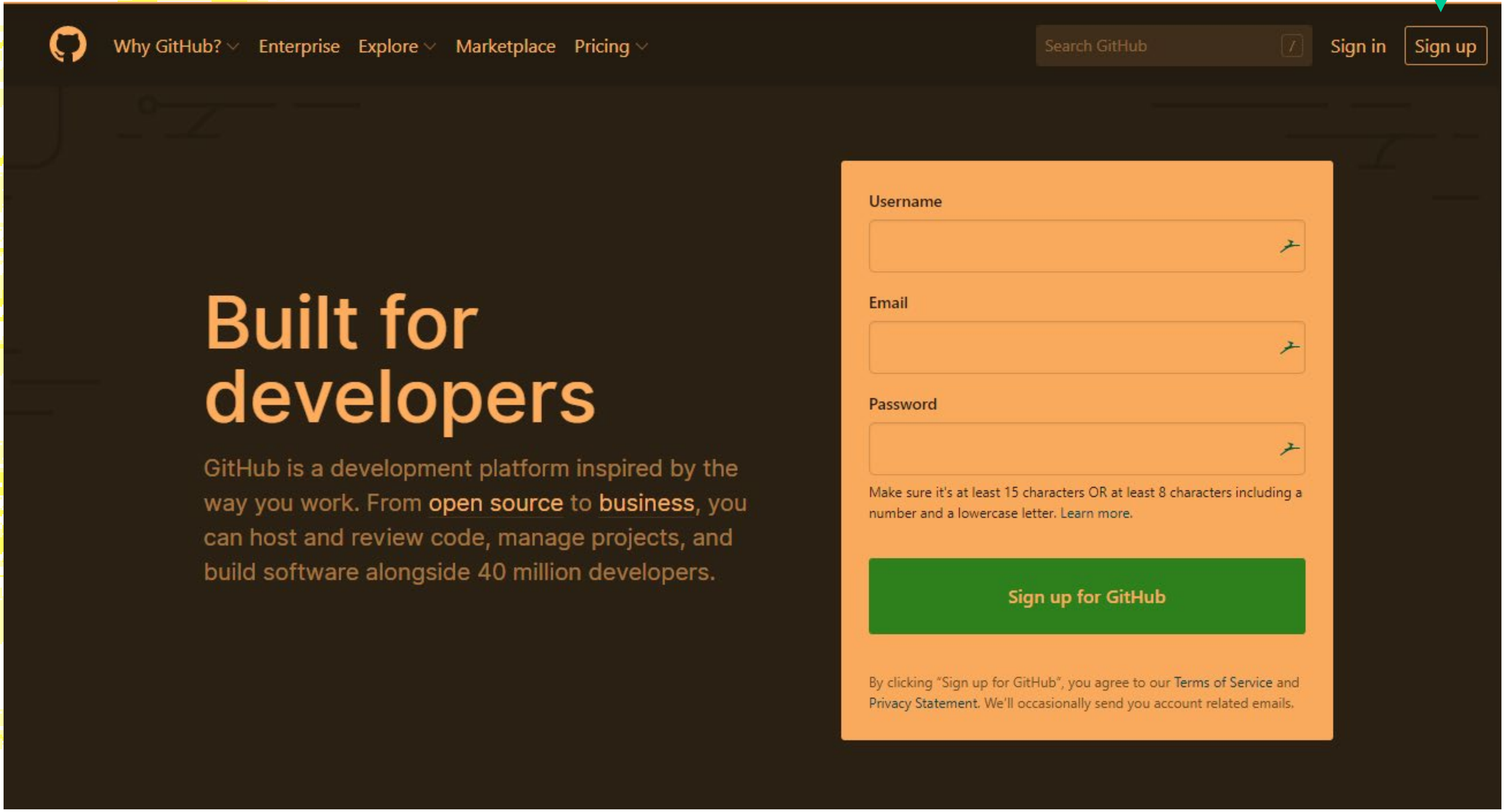
Take collaboration to the next level with security and administrative features built for businesses.

Or start a free trial of Enterprise Server →

Version Control system

GitHub - Registration

Step 2. If you don’t have an account, press the link “**sign up**”



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Sign up for GitHub

By clicking "Sign up for GitHub", you agree to our Terms of Service and Privacy Statement. We'll occasionally send you account related emails.

Version Control system

GitHub - Registration

Step 3. Introduce your user data as follows:

User: <ARA"your UPV user"> ex. ARAjosegqui

Email address: <your ETSID mail> ex. josegqui@etsid.upv.es>

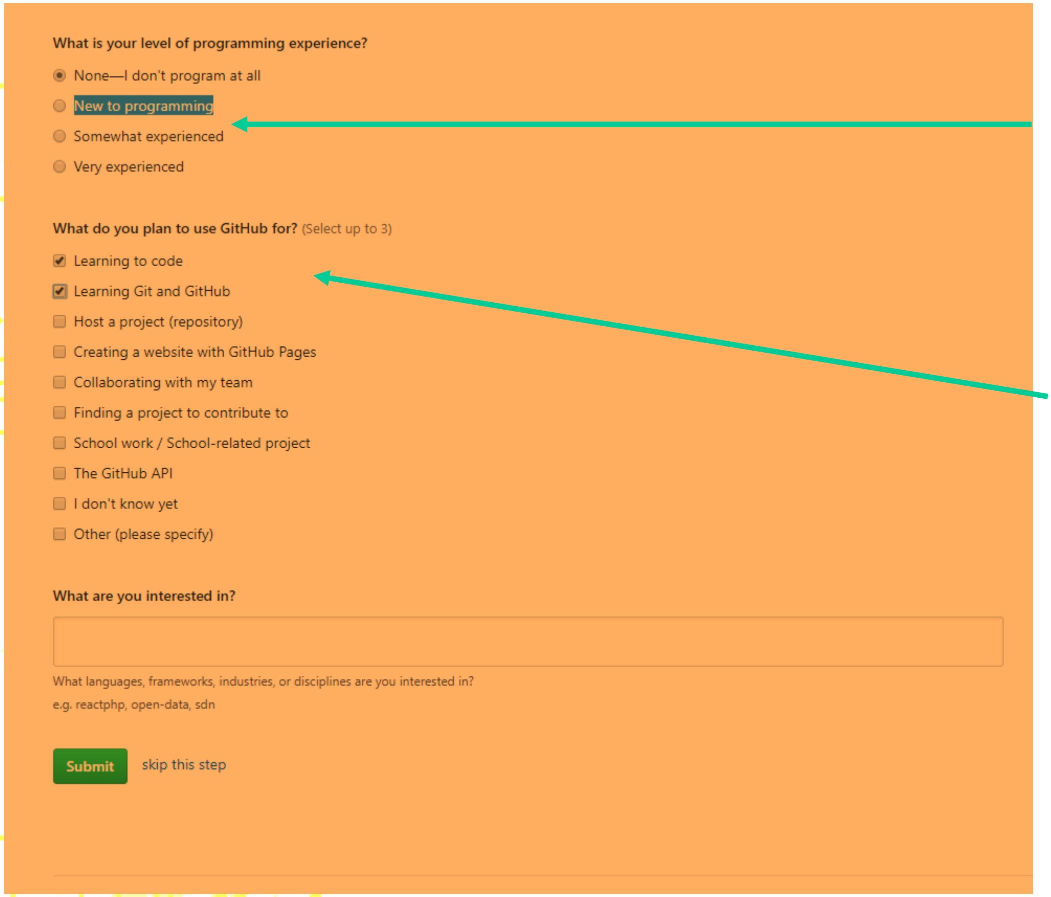
Password: <any> **Don't forget the password**

Step 4. Choose the **Free** subscription.

Version Control system

GitHub - Registration

Step 5. Answer the questions as follows:



What is your level of programming experience?

● None—I don't program at all

○ New to programming

○ Somewhat experienced

○ Very experienced

What do you plan to use GitHub for? (Select up to 3)

☑ Learning to code

☑ Learning Git and GitHub

□ Host a project (repository)

□ Creating a website with GitHub Pages

□ Collaborating with my team

□ Finding a project to contribute to

□ School work / School-related project

□ The GitHub API

□ I don't know yet

□ Other (please specify)

What are you interested in?

What languages, frameworks, industries, or disciplines are you interested in?
e.g. reactphp, open-data, sdn

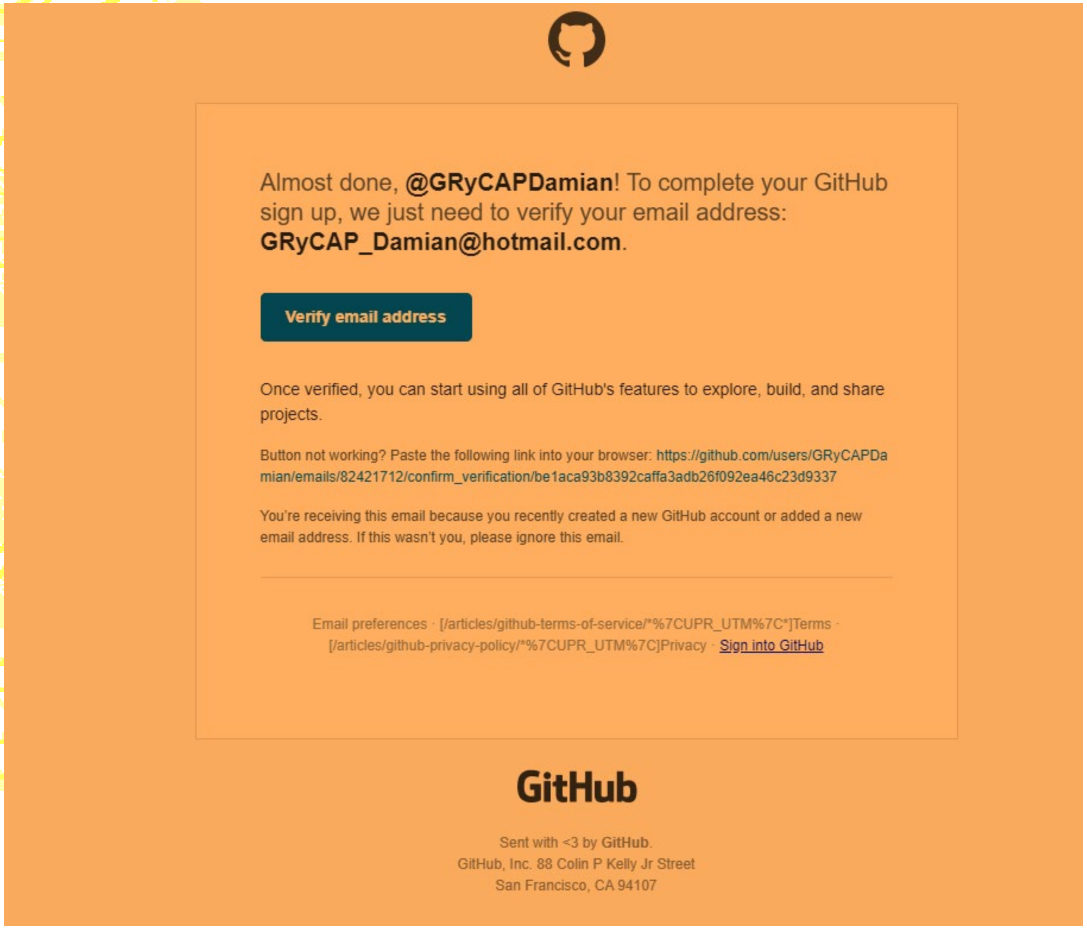
Check your own programming experience

Check these two options at least

Version Control system

GitHub - Registration

Step 6. You will receive an email to verify the GitHub account. Press to the “verify email address”.



Almost done, **@GRyCAPDamian**! To complete your GitHub sign up, we just need to verify your email address: **GRyCAP_Damian@hotmail.com**.

Once verified, you can start using all of GitHub's features to explore, build, and share projects.

Button not working? Paste the following link into your browser: https://github.com/users/GRyCAPDamian/emails/82421712/confirm_verification/be1aca93b8392caffa3adb26f092ea46c23d9337

You're receiving this email because you recently created a new GitHub account or added a new email address. If this wasn't you, please ignore this email.

Email preferences · [/articles/github-terms-of-service/*%7CUPR_UTM%7C*]Terms · [/articles/github-privacy-policy/*%7CUPR_UTM%7C]Privacy · Sign into GitHub

GitHub

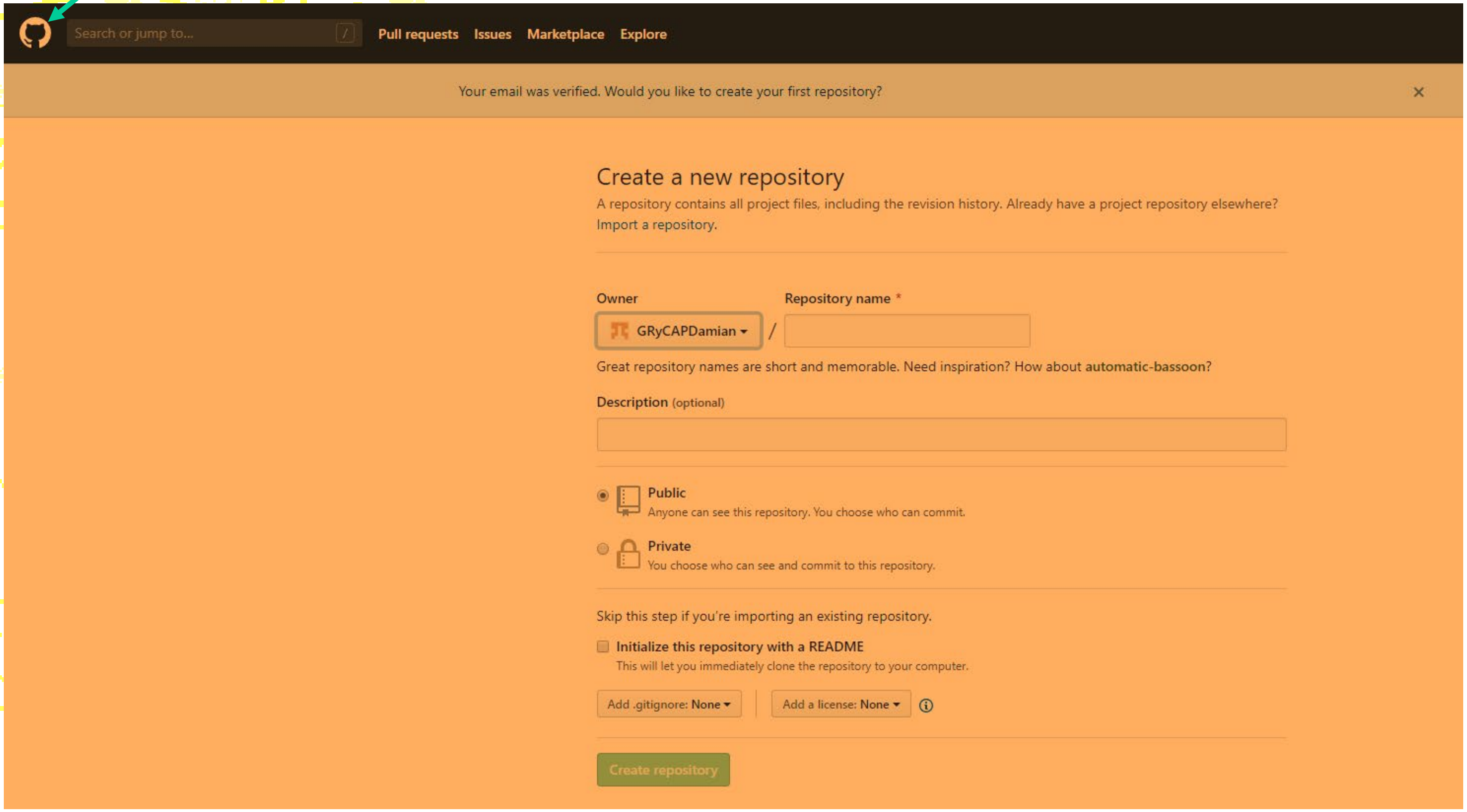
Sent with <3 by **GitHub**.
GitHub, Inc. 88 Colin P Kelly Jr Street
San Francisco, CA 94107

Version Control system

GitHub - Registration

Step 7. You don't create any repository.

Click on the GtitHub picture to go to the home



Your email was verified. Would you like to create your first repository? ×

Create a new repository

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

Owner: GRyCAPDamian / Repository name *

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

Description (optional)

● Public
Anyone can see this repository. You choose who can commit.

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

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

□ Initialize this repository with a README
This will let you immediately clone the repository to your computer.

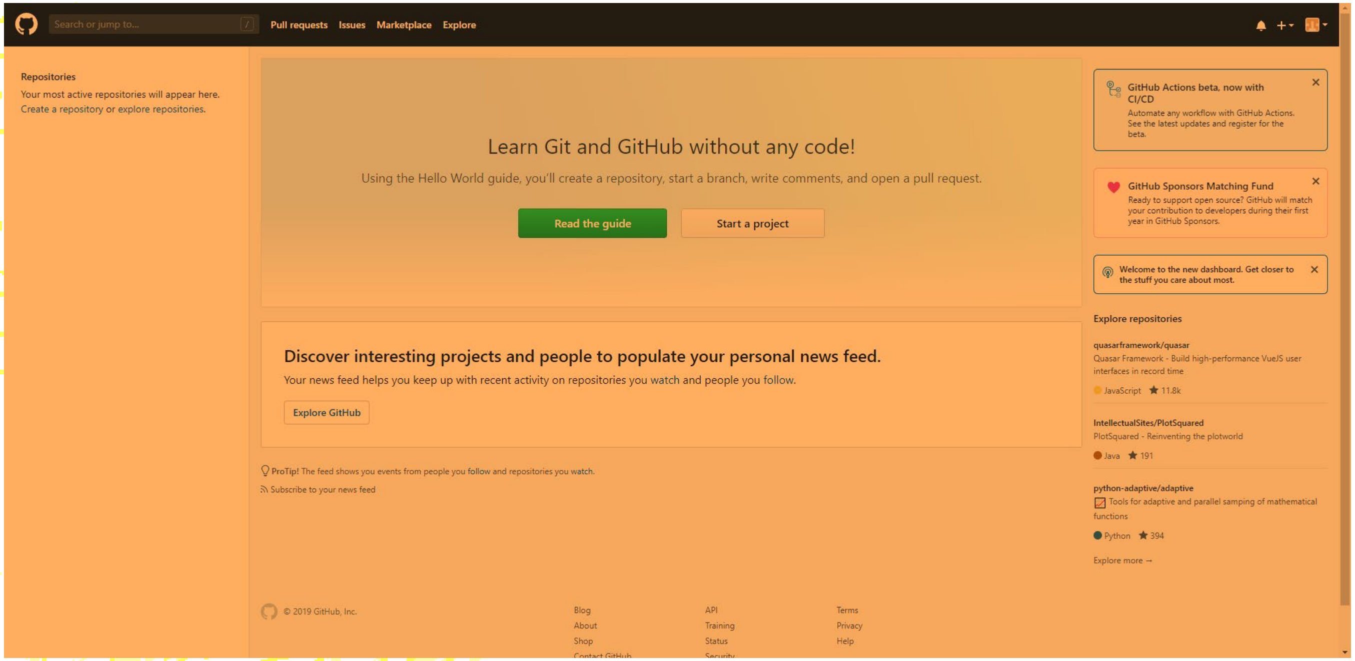
Add .gitignore: None ▾ | Add a license: None ▾ ⓘ

Create repository

Version Control system

GitHub - Registration

Step 8. In this moment you have an account in GitHub.



Repositories

Your most active repositories will appear here.
Create a repository or explore repositories.

Learn Git and GitHub without any code!

Using the Hello World guide, you'll create a repository, start a branch, write comments, and open a pull request.

Discover interesting projects and people to populate your personal news feed.

Your news feed helps you keep up with recent activity on repositories you watch and people you follow.

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

Subscribe to your news feed

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GitHub Actions beta, now with CI/CD

Automate any workflow with GitHub Actions. See the latest updates and register for the beta.

GitHub Sponsors Matching Fund

Ready to support open source? GitHub will match your contribution to developers during their first year in GitHub Sponsors.

Welcome to the new dashboard. Get closer to the stuff you care about most.

Explore repositories

quasarframework/quasar
Quasar Framework - Build high-performance VueJS user interfaces in record time
● JavaScript ★ 11.8k

IntellectualSites/PlotSquared
PlotSquared - Reinventing the plotworld
● Java ★ 191

python-adaptive/adaptive
Tools for adaptive and parallel samping of mathematical functions
● Python ★ 394

Explore more →

Congratulations !!!!

You are already a GitHub User !!!

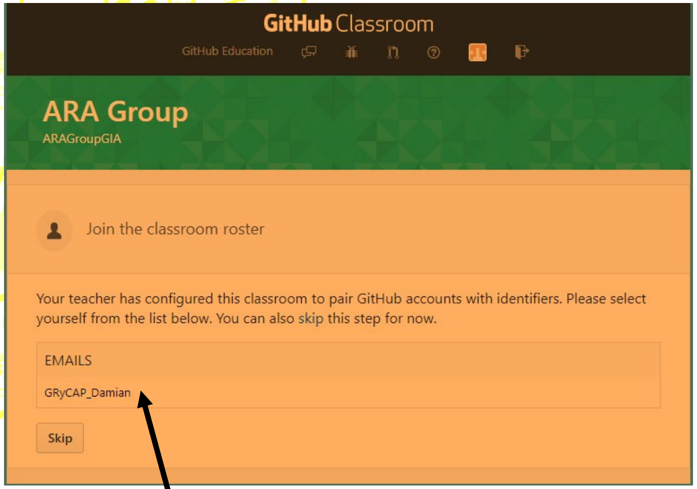
Version Control System

GitHub - Your first repository (arapractice00face)

- We are going to create your first repository which corresponds to the first practice lesson. The steps to perform are the follows:

Step 1. Access to PoliformaT and open the task which corresponds to practice 0 (face). The task provides information about a URL. The URL will be similar to this: https://classroom.github.com/a/3JhNMj18

Step 2. Open the URL using a web browser (Chrome, Internet Explorer …). Then, you will visualize the Github Classroom:



Join the classroom roster

Your teacher has configured this classroom to pair GitHub accounts with identifiers. Please select yourself from the list below. You can also skip this step for now.

EMAILS

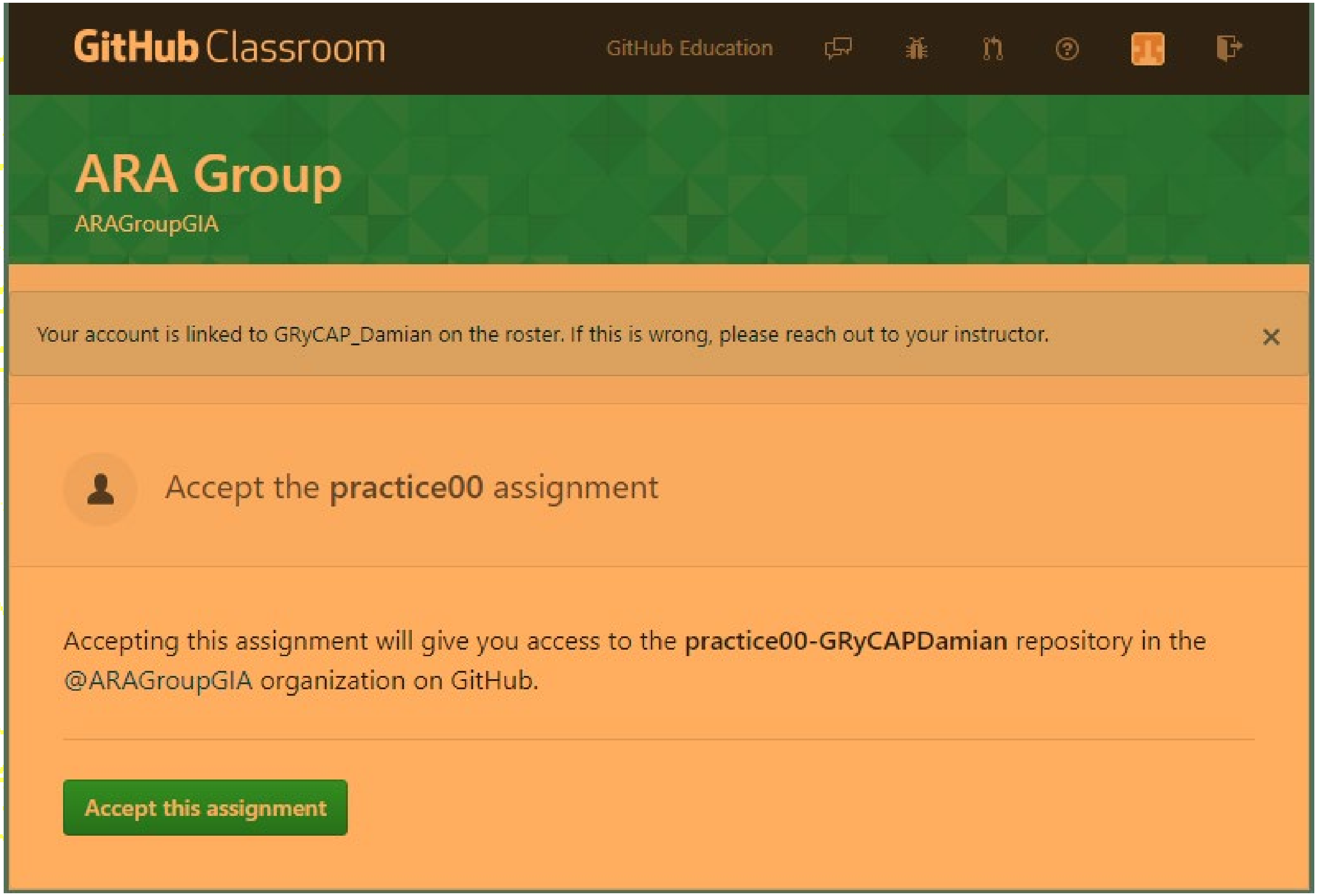
GRyCAP_Damian

Choose your name from the list and click on it.

Version Control System

GitHub - Your first repository (arapractice00face)

Step 3. Accept the assignment of practice 0 (face).



Your account is linked to GRyCAP_Damian on the roster. If this is wrong, please reach out to your instructor.

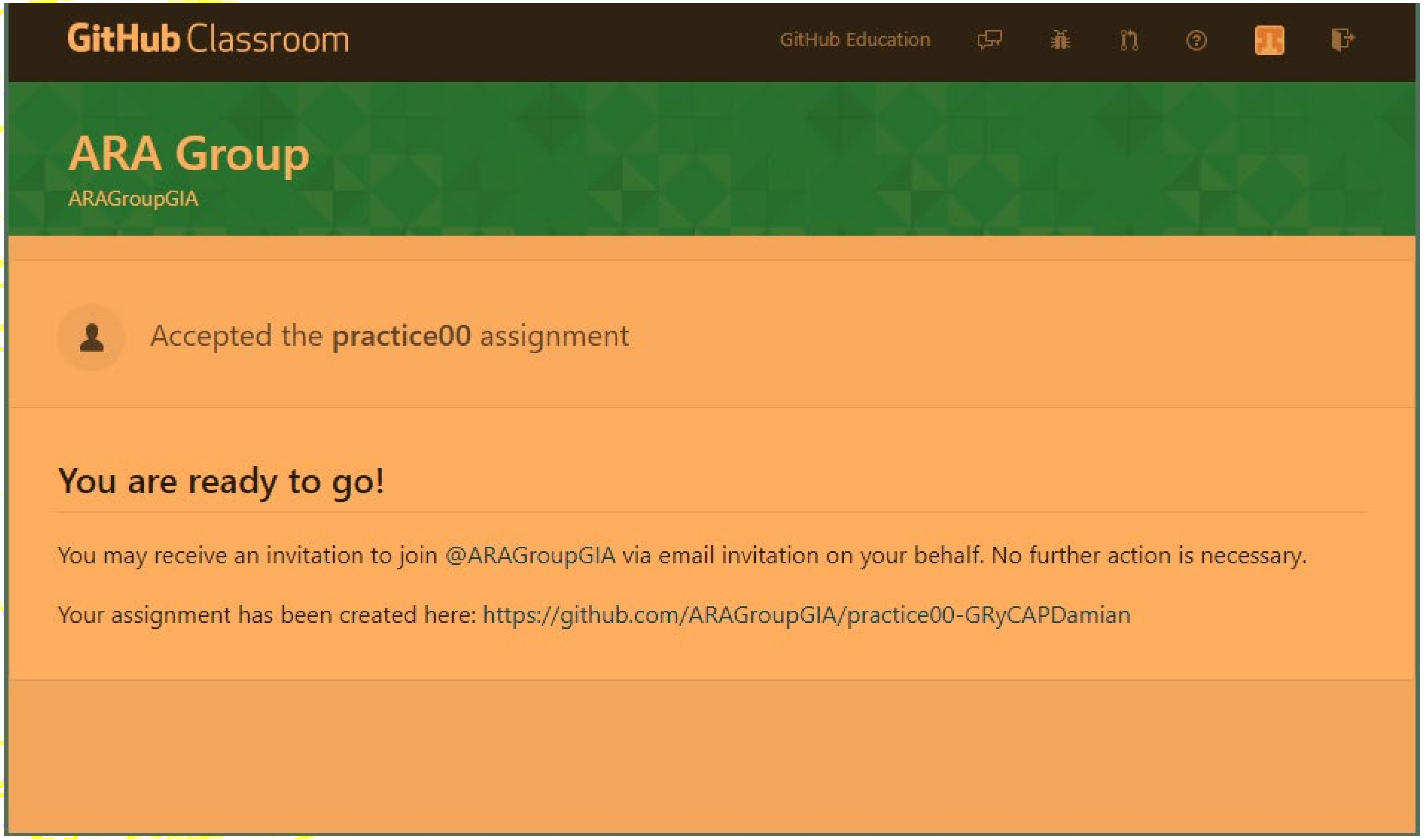
Accept the **practice00** assignment

Accepting this assignment will give you access to the **practice00-GRyCAPDamian** repository in the @ARAGroupGIA organization on GitHub.

Version Control System

GitHub - Your first repository (arapractice00face)

Step 4. You will be accepted and a repository named **ARApractice00face** will be created at your GitHub account.



Accepted the **practice00** assignment

You are ready to go!

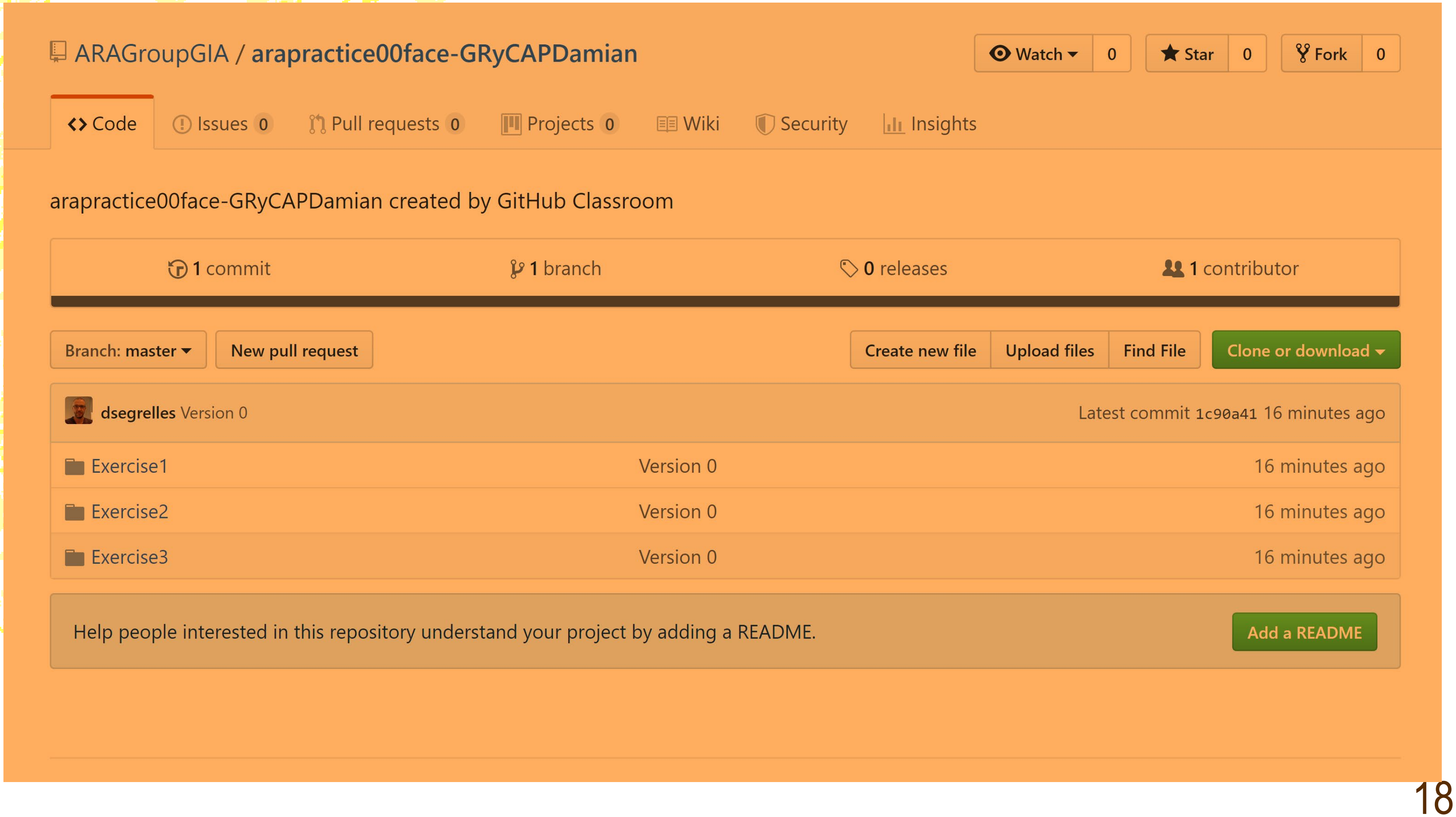
You may receive an invitation to join @ARAGroupGIA via email invitation on your behalf. No further action is necessary.

Your assignment has been created here: https://github.com/ARAGroupGIA/practice00-GRyCAPDamian

Version Control System

GitHub - Your first repository

Step 5. You can access to the repository using your GitHub account or clicking in the URL that it is showed in the screen (https://github.com/ARAGroupGIA/practice00-GRyCAPDamian).



ARAGroupGIA / arapractice00face-GRyCAPDamian

arapractice00face-GRyCAPDamian created by GitHub Classroom

1 commit · 1 branch · 0 releases · 1 contributor

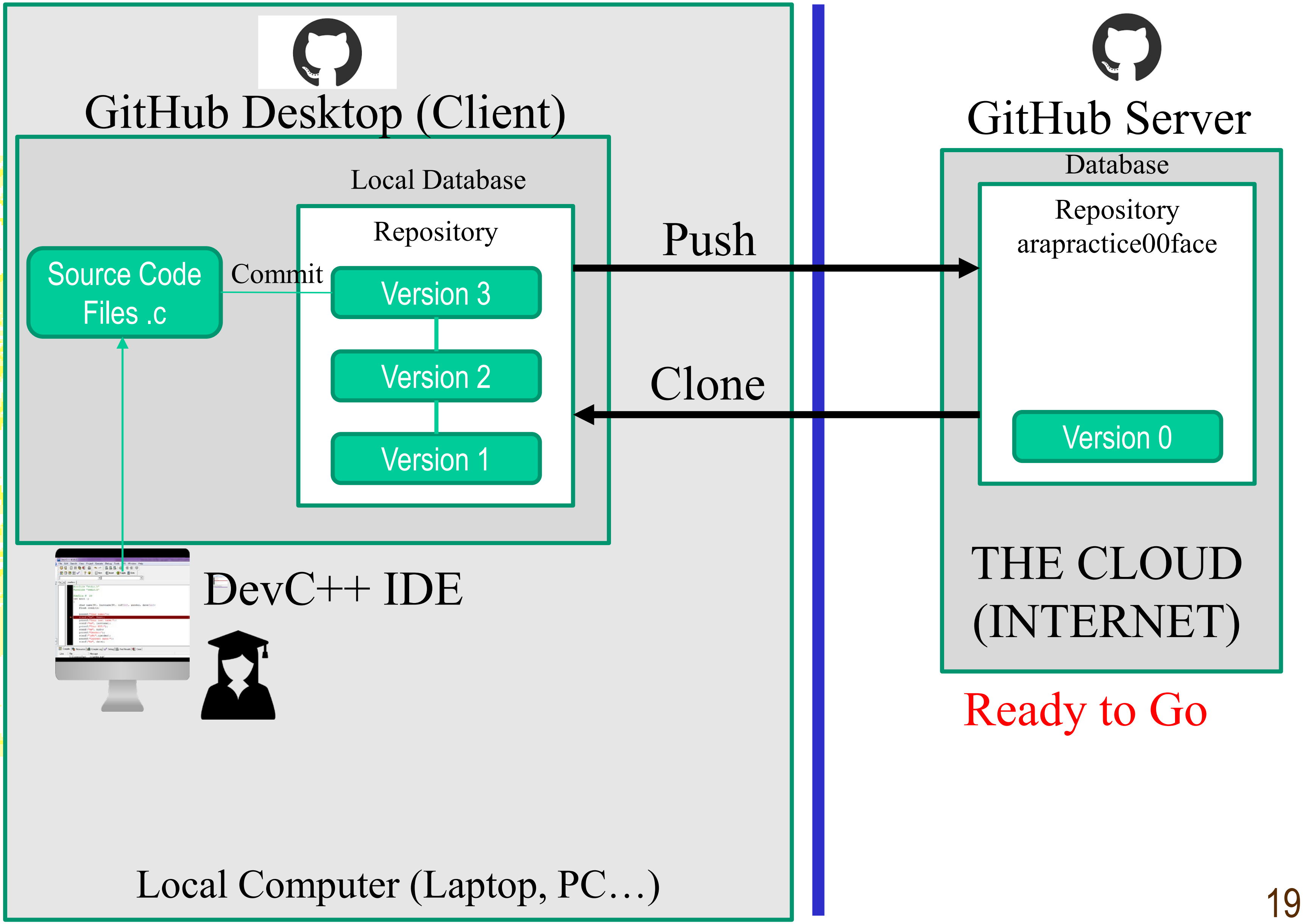
dsegrelles Version 0 — Latest commit 1c90a41 16 minutes ago

Exercise1	Version 0	16 minutes ago
Exercise2	Version 0	16 minutes ago
Exercise3	Version 0	16 minutes ago

Help people interested in this repository understand your project by adding a README.

Version Control System

GitHub



GitHub Desktop (Client)

Local Database

Repository

Source Code Files .c

Commit

Version 3

Version 2

Version 1

DevC++ IDE

Local Computer (Laptop, PC…)

Push

Clone

GitHub Server

Database

Repository arapractice00face

Version 0

THE CLOUD (INTERNET)

Ready to Go

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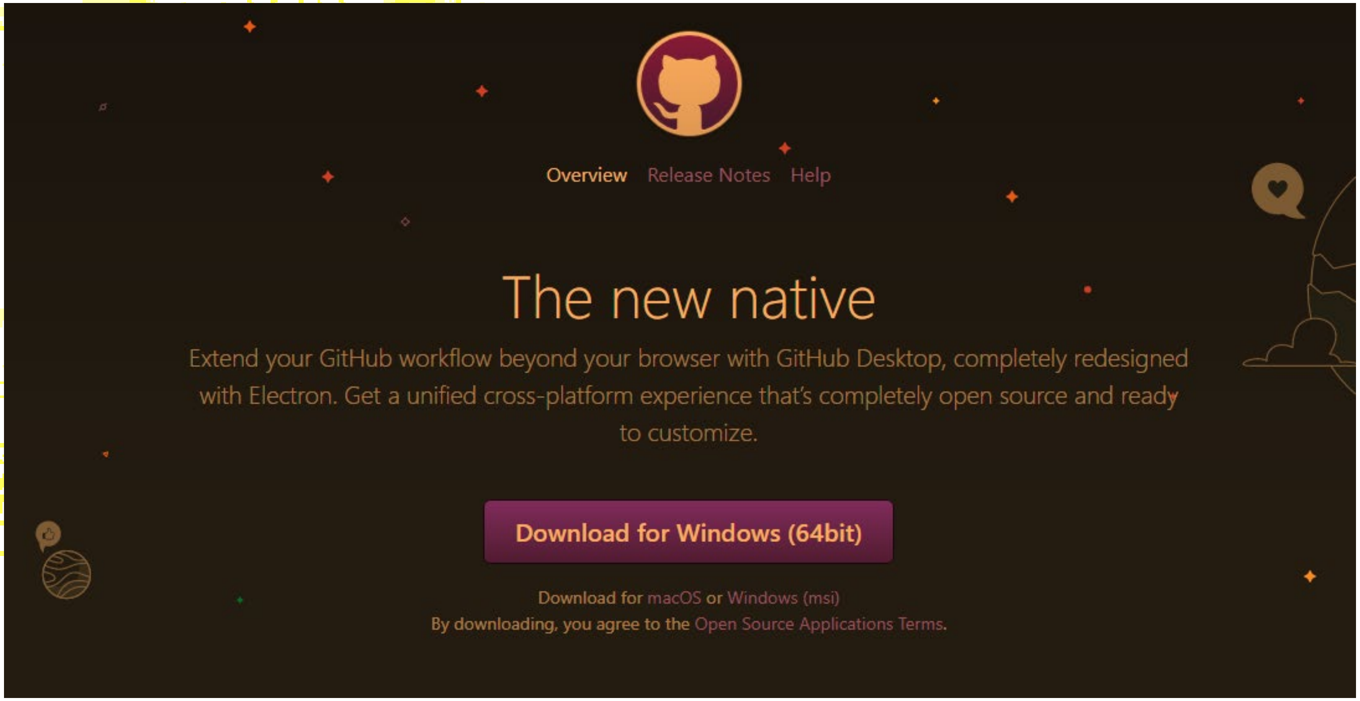
Version Control System

GitHub Desktop – Installation & Configuration

- **To Install at your personal computer the GitHub Desktop, you should:**

Step 1. Entry to this address:

https://desktop.github.com/



The new native

Extend your GitHub workflow beyond your browser with GitHub Desktop, completely redesigned with Electron. Get a unified cross-platform experience that's completely open source and ready to customize.

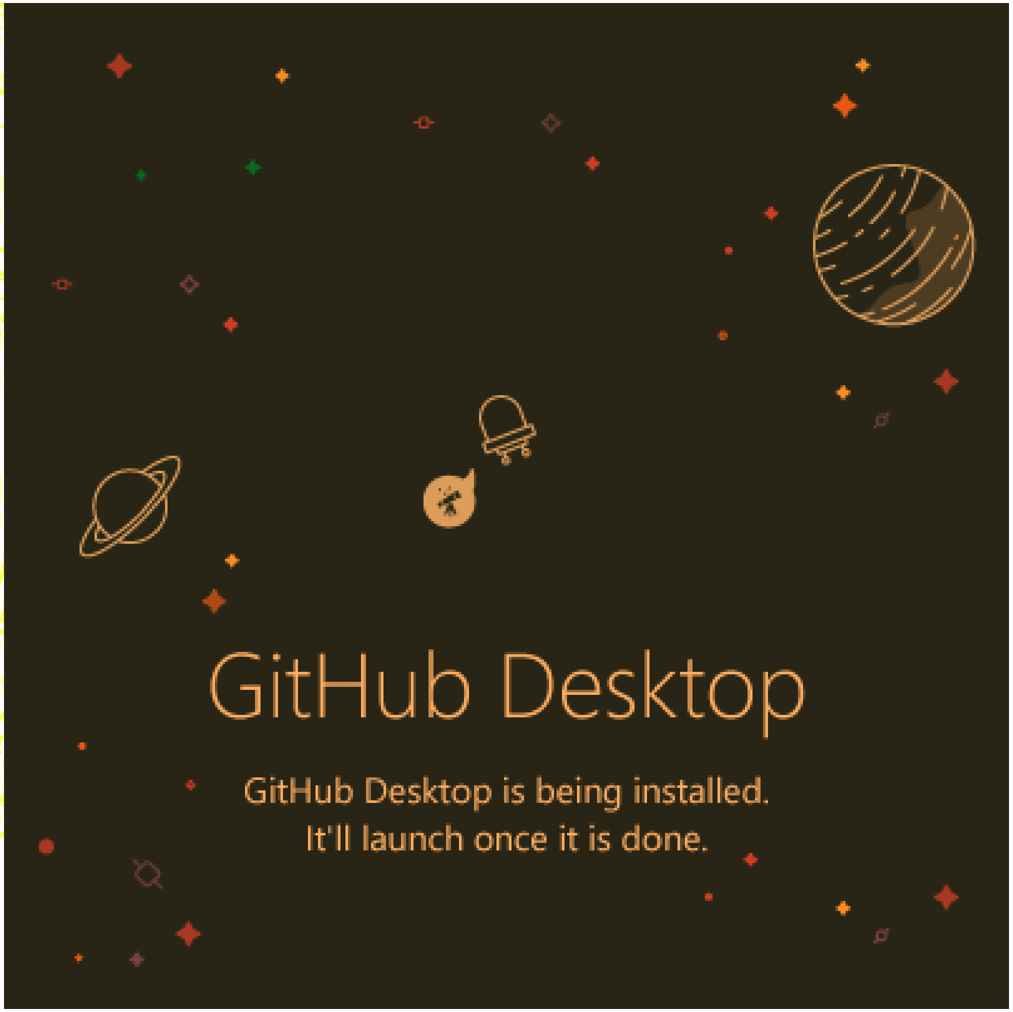
Download for macOS or Windows (msi)

By downloading, you agree to the Open Source Applications Terms.

Version Control System

GitHub Desktop – Installation & Configuration

Step 2. Download the installation file and execute it.



GitHub Desktop

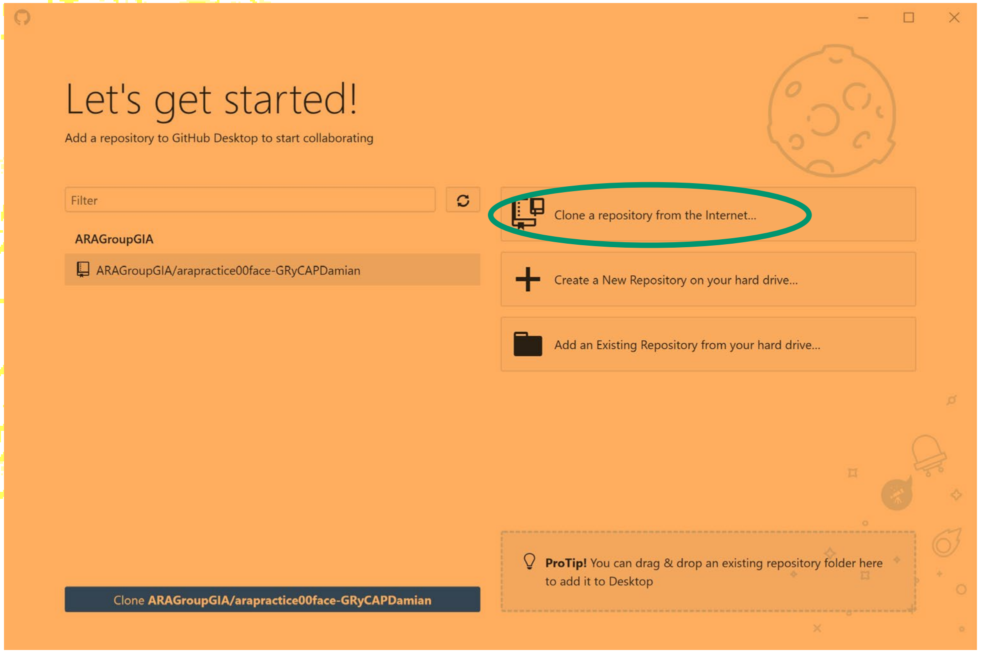
GitHub Desktop is being installed.
It'll launch once it is done.

Version Control System

GitHub Desktop – Installation & Configuration

Step 3. Configure GitHub Desktop introducing your Github account (User and Password).

Step 4. Clone your repository (arapractice00face) at the local machine. For that, first you choose the option "Clone repository from the internet".



Let's get started!

Add a repository to GitHub Desktop to start collaborating

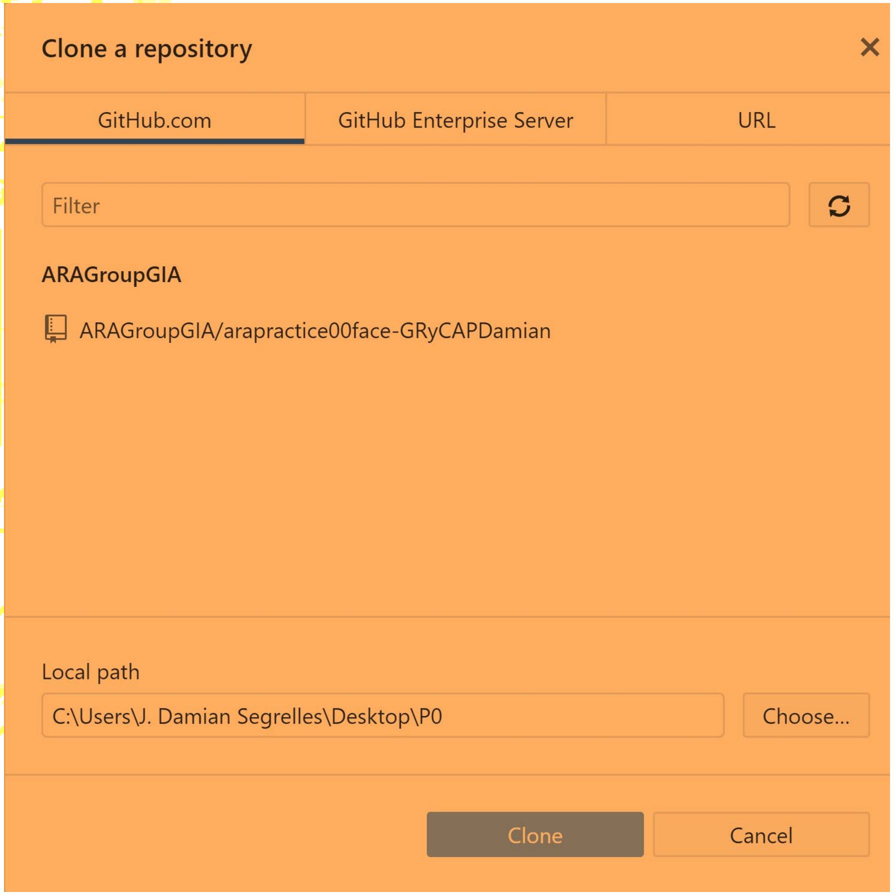
Filter
ARAGroupGIA
ARAGroupGIA/arapractice00face-GRyCAPDamian
Clone a repository from the Internet...
Create a New Repository on your hard drive...
Add an Existing Repository from your hard drive...
Clone ARAGroupGIA/arapractice00face-GRyCAPDamian

ProTip! You can drag & drop an existing repository folder here to add it to Desktop

Version Control System

GitHub Desktop – Installation & Configuration

Step 5. Choose the repository to clone (in this case “ARAGroupGIA/arapractice00face-…”) and the local path where the repository will be cloned.



Clone a repository

ARAGroupGIA

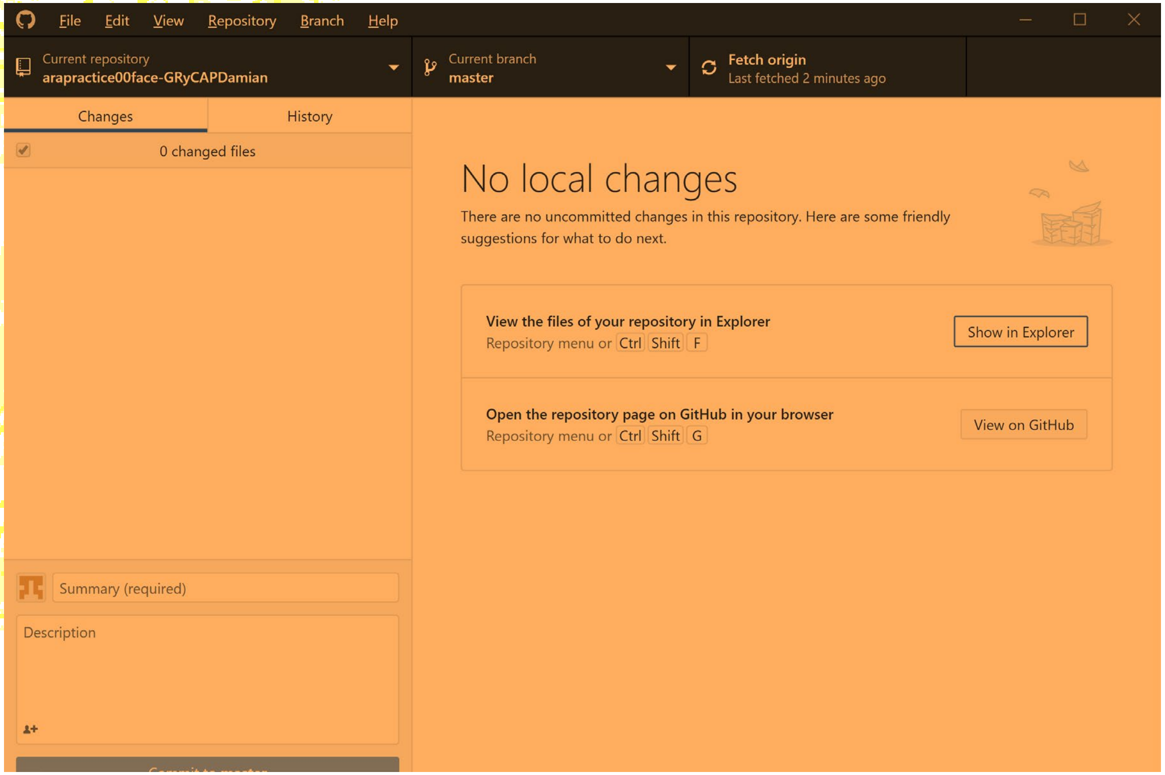
ARAGroupGIA/arapractice00face-GRyCAPDamian

Local path: C:\Users\J. Damian Segrelles\Desktop\P0

Version Control System

GitHub Desktop – Installation & Configuration

Step 6. Automatically, in your local machine a new folder will be created with the same files of your GitHub repository. You can explore the local files choosing "show in explorer" and also the GitHub files on the cloud choosing "view on GitHub"



No local changes

There are no uncommitted changes in this repository. Here are some friendly suggestions for what to do next.

View the files of your repository in Explorer
Repository menu or Ctrl Shift F

Open the repository page on GitHub in your browser
Repository menu or Ctrl Shift G

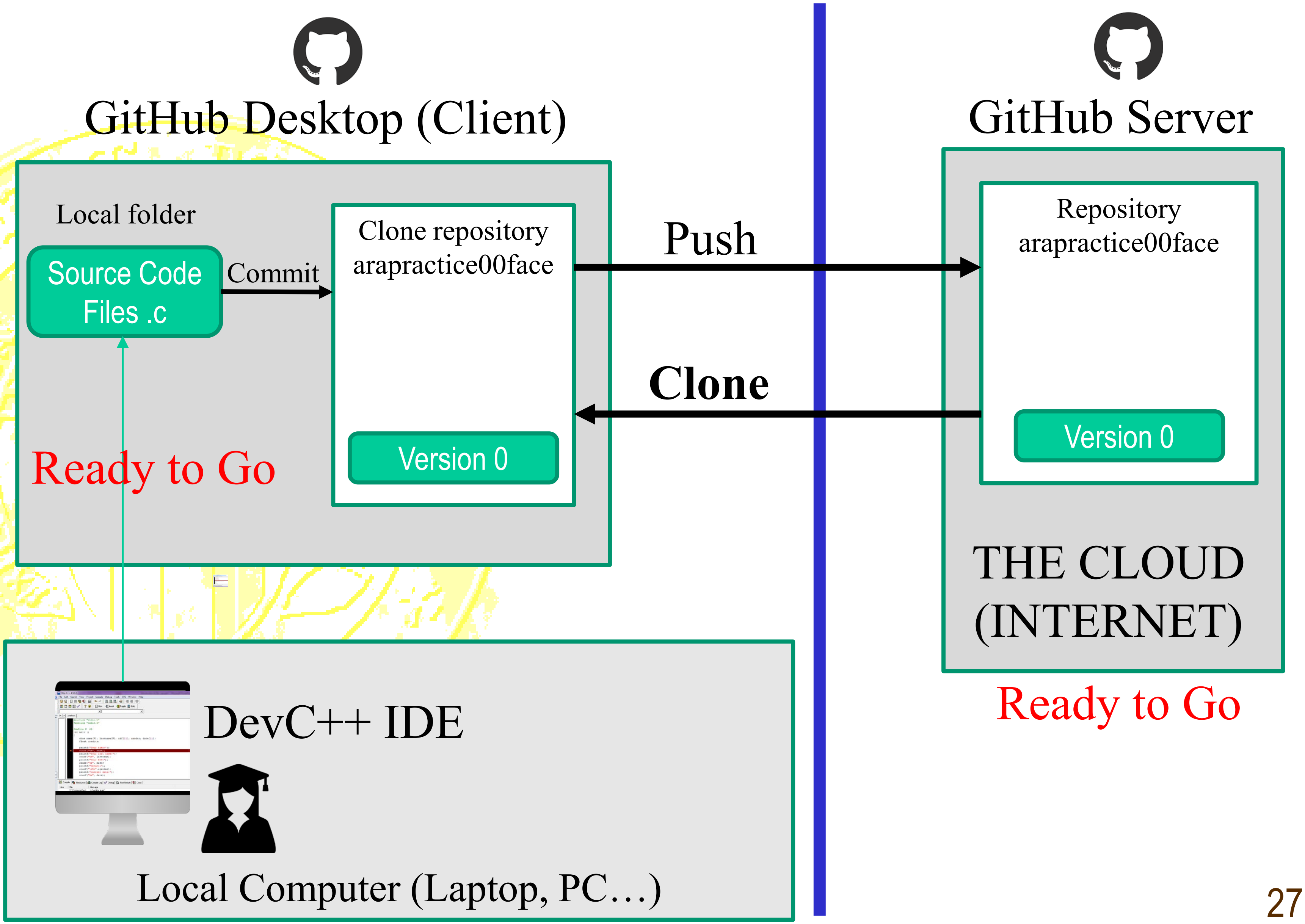
Version Control System

GitHub Desktop – Installation & Configuration

Congratulations !!!
You are ready to
start the practice00
and develop your
own programs

Version Control System

GitHub



GitHub Desktop (Client)

Local folder

Source Code Files .c

Commit

Clone repository arapractice00face

Version 0

Ready to Go

Push

Clone

GitHub Server

Repository arapractice00face

Version 0

THE CLOUD (INTERNET)

Ready to Go

DevC++ IDE

Local Computer (Laptop, PC…)

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Integrated Development System

- An Integrated Development Environment (IDE) is software application that provides comprehensive facilities to computer programmers for software development.
- An IDE normally consists of at least a source code editor, build automation tools (compile), and a debugger.
- Some examples are NetBeans, Eclipse, Developer studio, **DevC++** etc...

Integrated Development System

Dev-C ++ IDE Framework

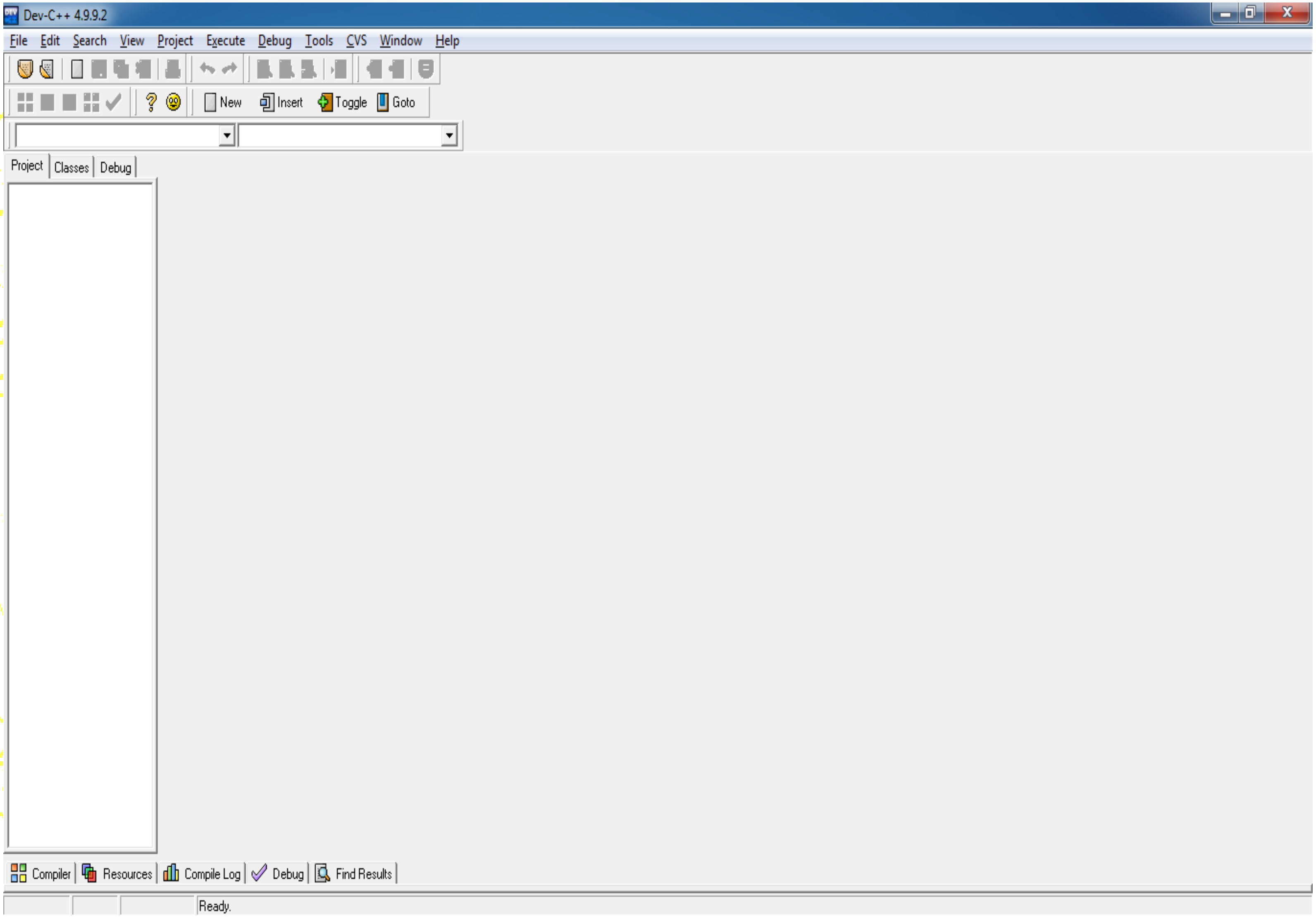
- You may download Dev-C++ from the web site:

https://sourceforge.net/projects/orwelldevcpp

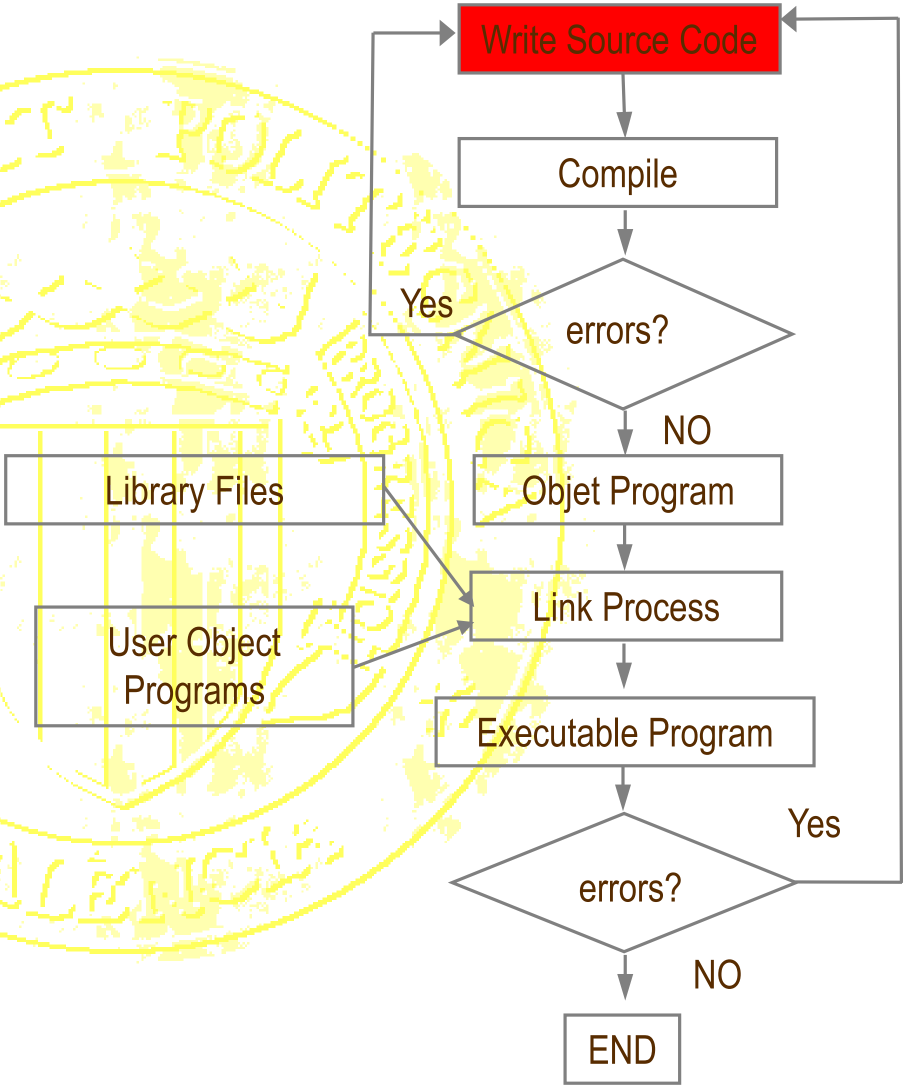
- Also, you can download from poliformaT a portable version that it don’t require installation (**Recommend** !!).

Integrated Development System

Dev-C ++ IDE Framework

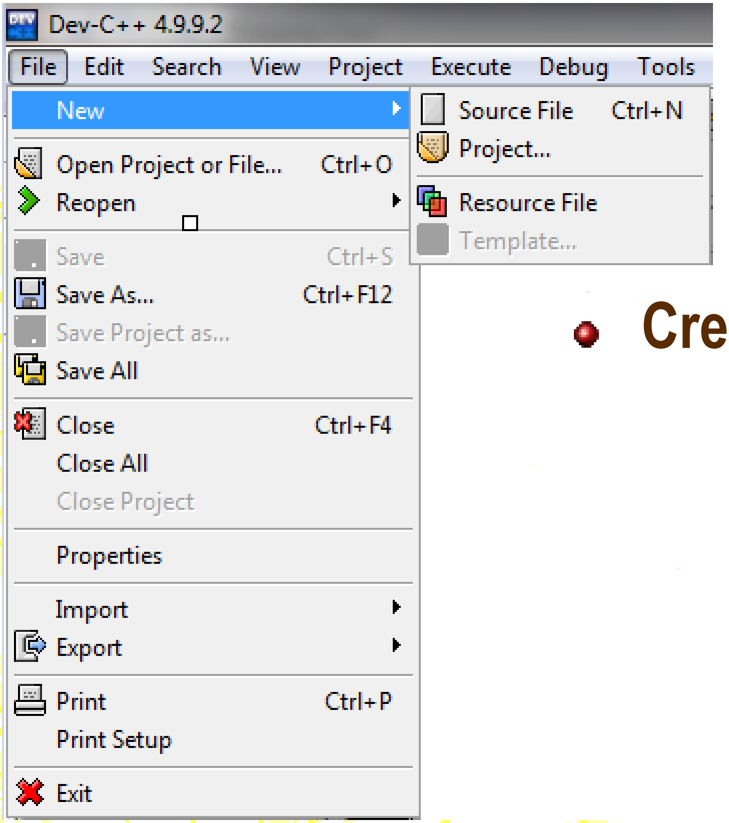

Dev-C++ 4.9.9.2
File Edit Search View Project Execute Debug Tools CVS Window Help
New Insert Toggle Goto
Project Classes Debug
Compiler Resources Compile Log Debug Find Results
Ready.

Dev-C ++ IDE Framework
Implementation Process (Write Source Code)



Dev-C ++ IDE Framework

Implementation Process (Write Source Code)



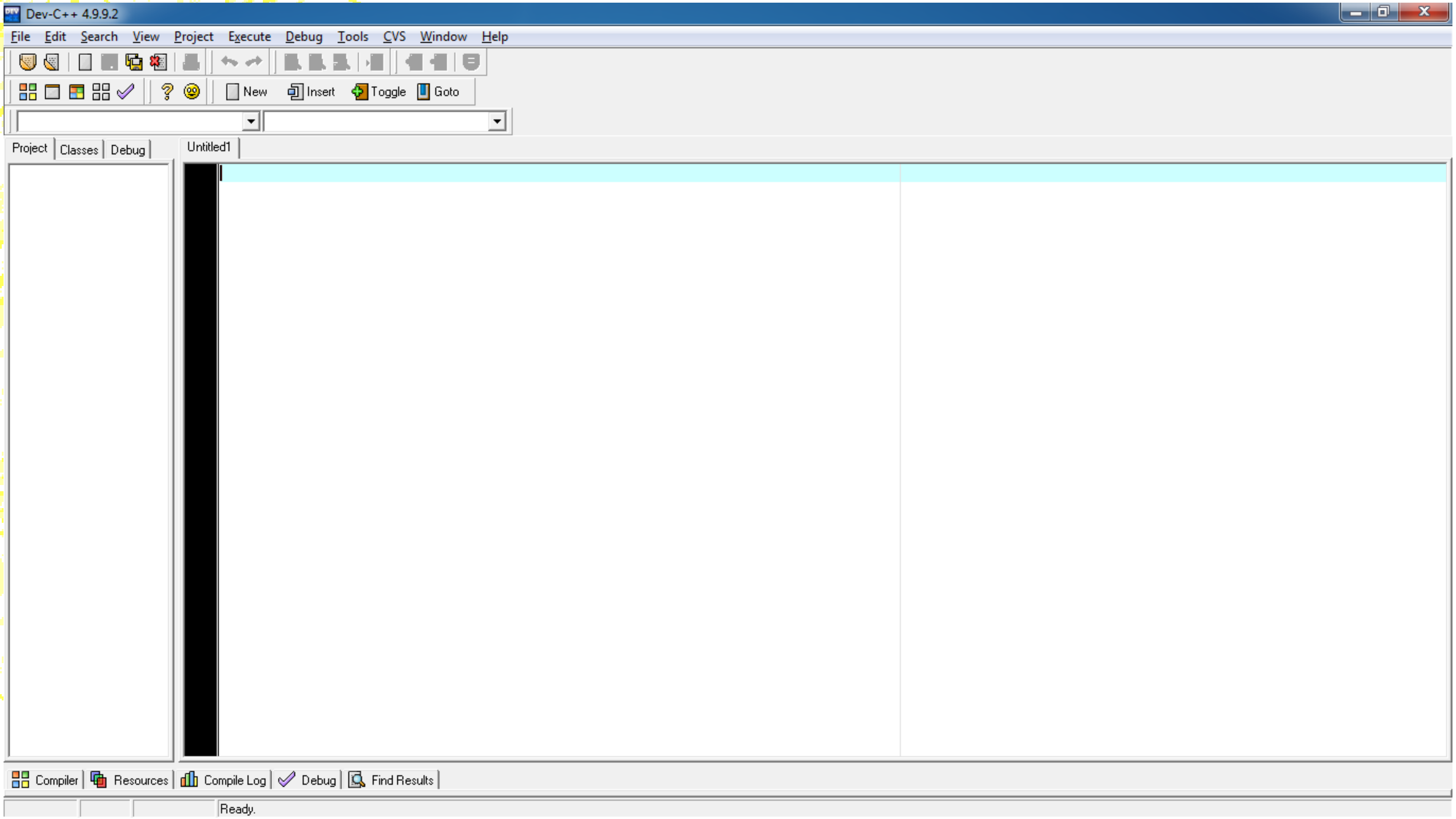
- **Create a new source file:**

File → New → Source File (Ctrl+N)

Dev-C ++ IDE Framework

Implementation Process (Write Source Code)

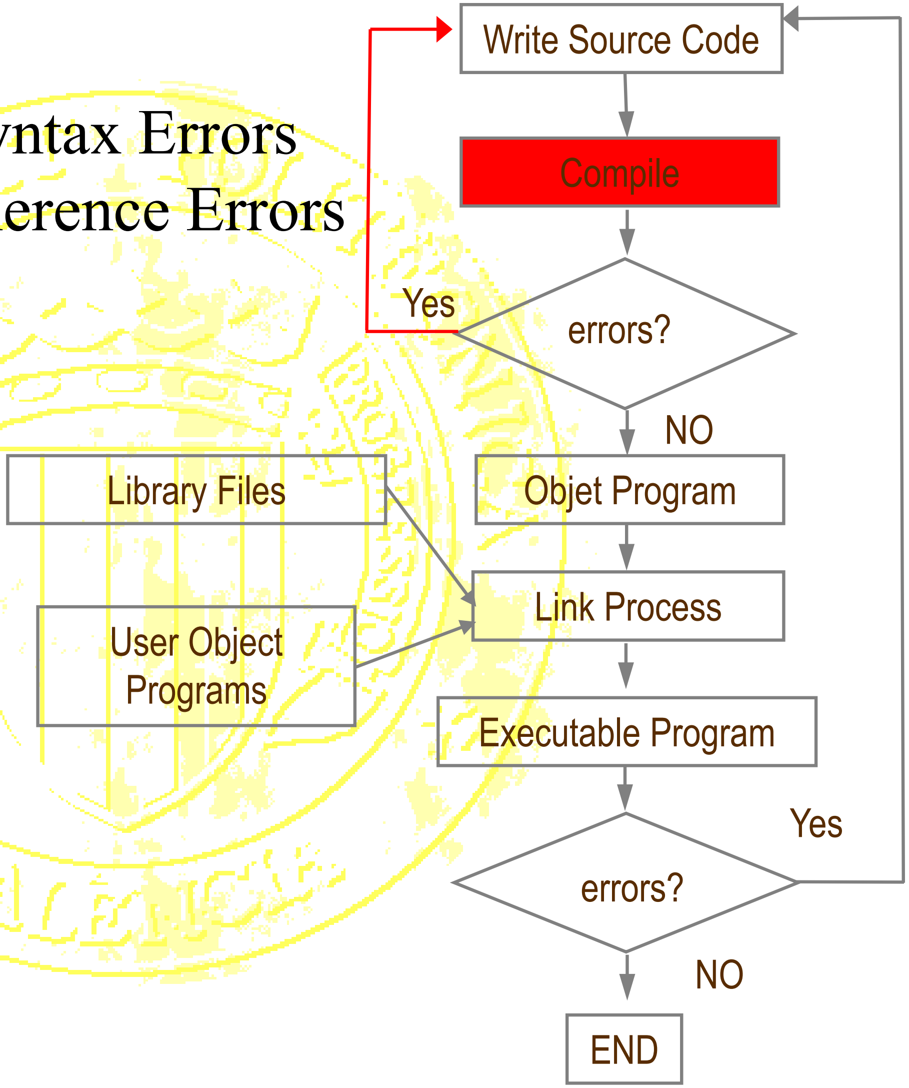
- A blank document will appear in the right pane of the main window, such that the source code is edited in it.



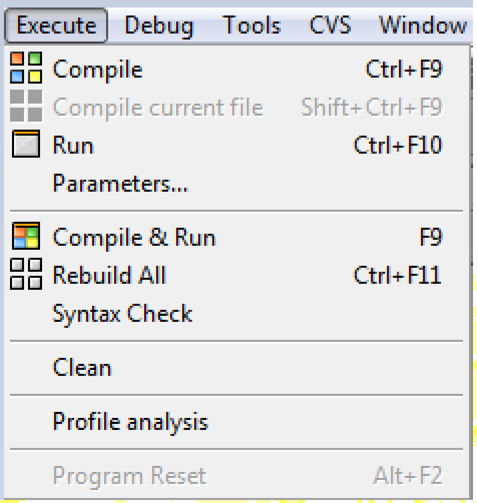
Dev-C ++ IDE Framework

Implementation Process (Compile)

Syntax Errors
Coherence Errors



Dev-C ++ IDE Framework
Implementation Process (Compile)



- **To compile a source file:**

  Execute → Compile (Ctrl+F9)

  Push button

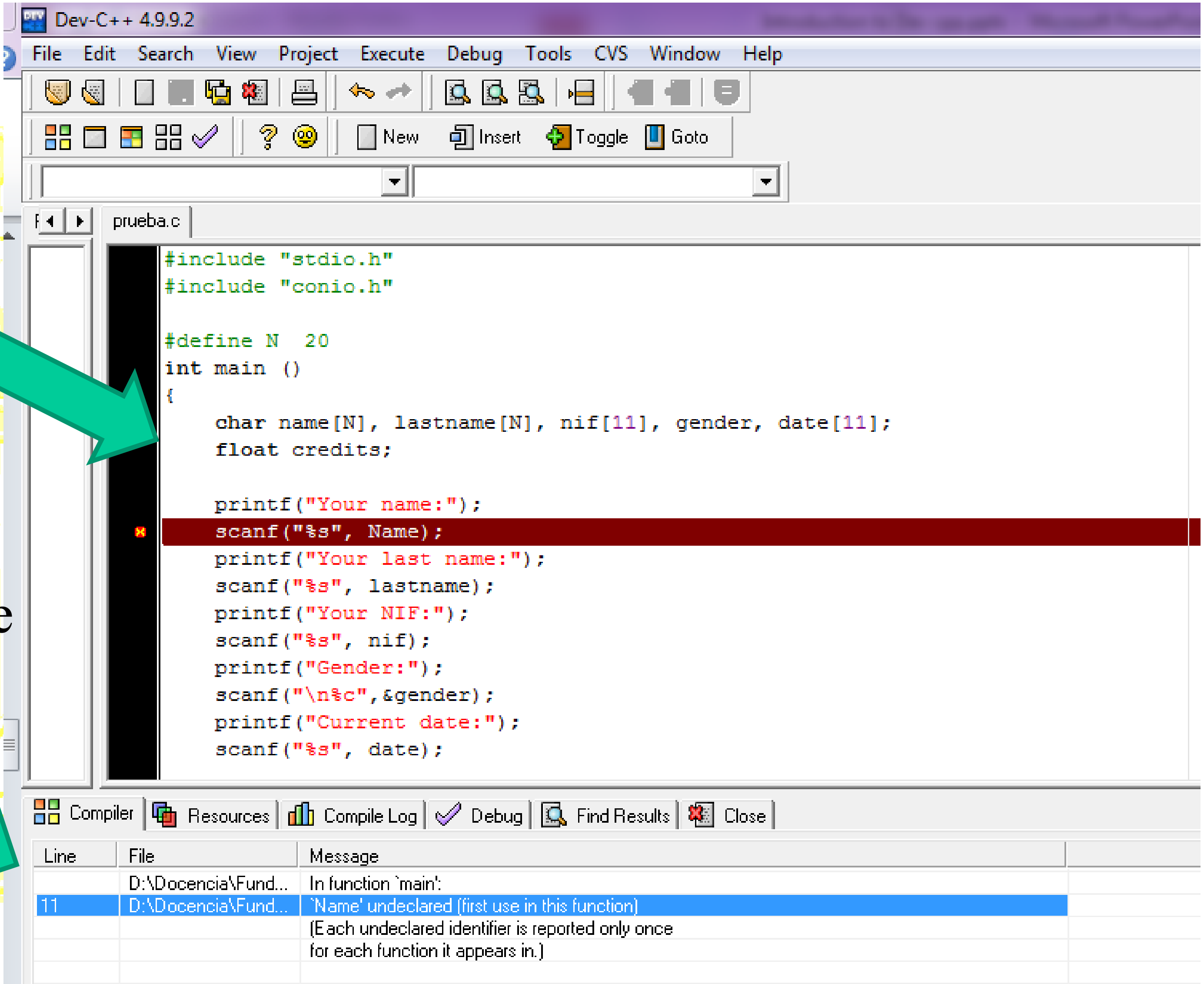
- **Syntax Errors:** Occur when program statements do not conform to the rules of the programming language. The compiler detects wrong statements and shows information about such errors. Example: forgetting a semicolon at the end of an assignment statement.
- **Coherence Errors:** Some examples of these type of error are:
  - The use of a variable is inadequate with respect to its definition.
  - The definition of a function does not coincide with its declaration.
  - When the formal parameters does not coincide with the actual parameters of a function.

Dev-C ++ IDE Framework

Implementation Process (Compile)

Source Code

Compiler's messages after the source code is compiled.



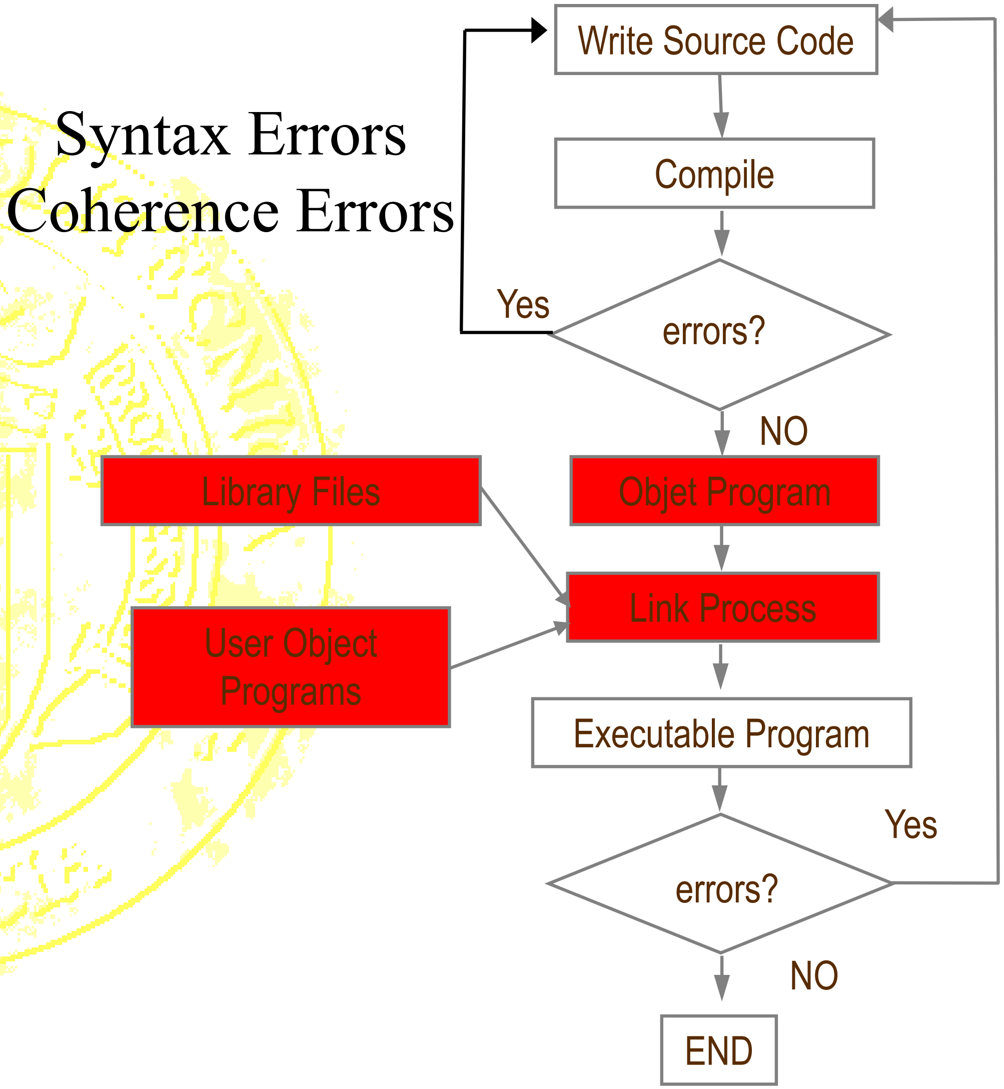
```
#include "stdio.h"
#include "conio.h"

#define N  20
int main ()
{
    char name[N], lastname[N], nif[11], gender, date[11];
    float credits;

    printf("Your name:");
    scanf("%s", Name);
    printf("Your last name:");
    scanf("%s", lastname);
    printf("Your NIF:");
    scanf("%s", nif);
    printf("Gender:");
    scanf("\n%c",&gender);
    printf("Current date:");
    scanf("%s", date);
```

Line	File	Message
	D:\Docencia\Fund...	In function `main':
11	D:\Docencia\Fund...	`Name' undeclared (first use in this function)
		(Each undeclared identifier is reported only once
		for each function it appears in.)

Dev-C ++ IDE Framework
Implementation Process (Compile)



Syntax Errors
Coherence Errors

Write Source Code

Compile

errors?

Yes

NO

Library Files

Objet Program

Link Process

User Object Programs

Executable Program

errors?

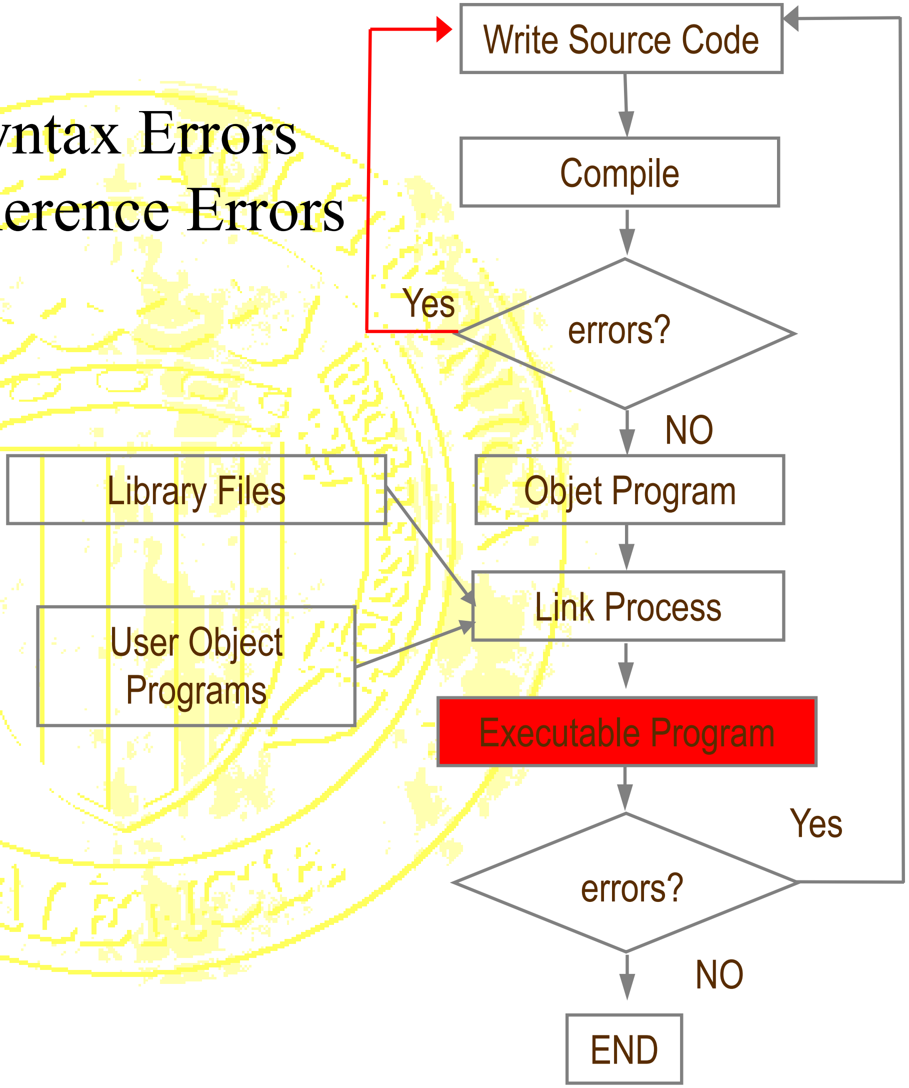
Yes

NO

END

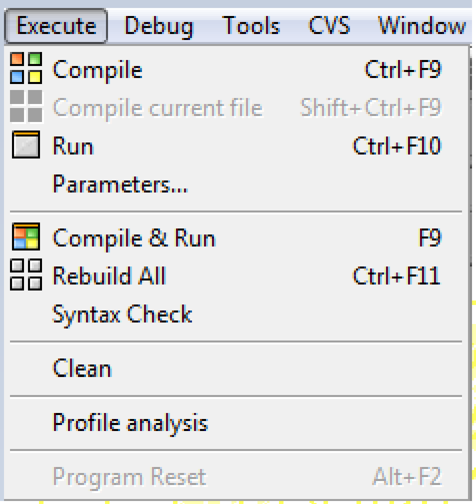
Dev-C ++ IDE Framework
Implementation Process(Execute)

Syntax Errors
Coherence Errors



Run-Time Errors
Semantic Errors

Dev-C ++ IDE Framework
Implementation Process(Execute)



- **To run a program:**

  Execute → Run (Ctrl+F10)

  Push button

- **Run – Time Errors. These errors are those that appear when the program is running and generally, they are due to execute operations that receive inadequate values. Example: Division by zero, square root of a negative value, open a file that is corrupted.**

- **Semantic Errors. These errors are the cause of obtaining a program with a invalid logic that provides wrong results.**

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    - Installatatiom & Configuration
- **Practice 00 Face**
- Practice 01 Face

Practice 0 Face
Exercise 1 – Your First Program (Version 1)

- Go to the local folder where is cloned the practice 0 (Face) and open the template (exercise1.c) using Devc++. The template is located at:

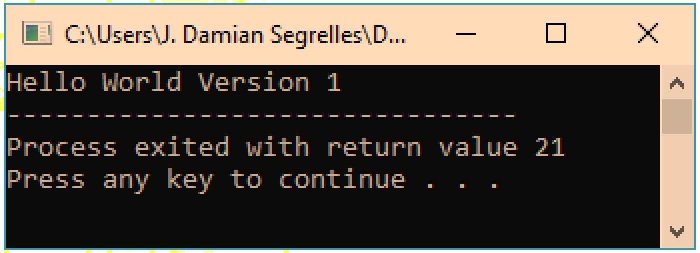
  ../Exercise1/exercise1.c

- Fill the template of the exercise 1 to show the message "Hello World Version 1" on screen.

Practice 0 Face

Exercise 1 – Your First Program (Version 1)

- Use the function «Compile» of Dev-C++ (CTRL + F9). The source file will be compiled and a new executable file will be created.
- Execute the program and test that works correctly.
- The result of your program should be the follow:



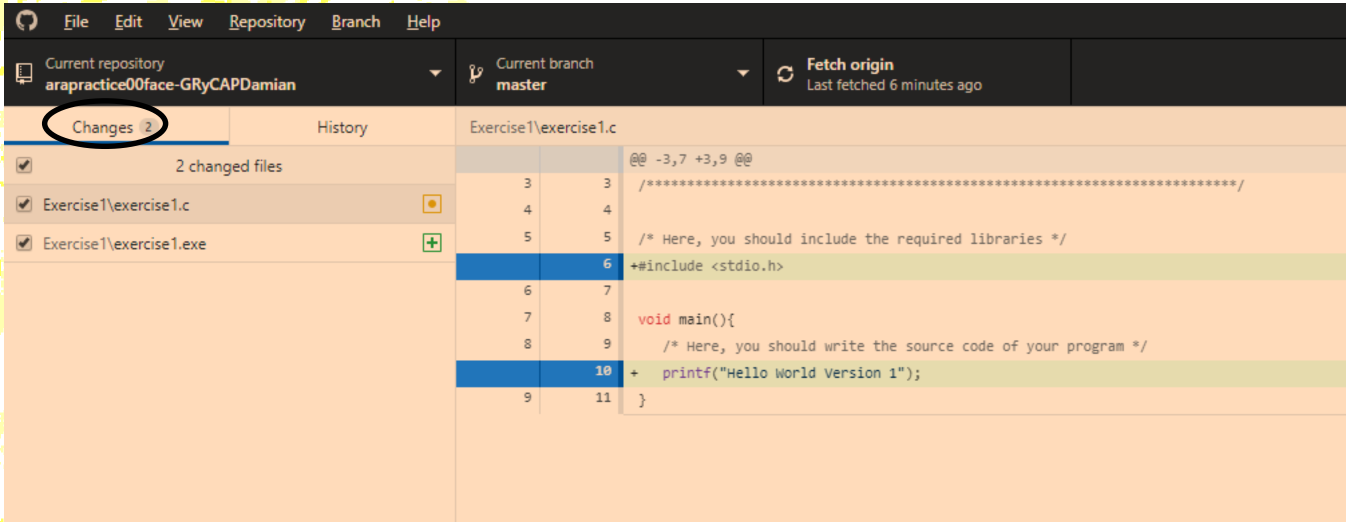
```
Hello World Version 1
--------------------------------
Process exited with return value 21
Press any key to continue . . .
```

- If woks correctly, CONGRATULATIONS, this is the first version of your first program.

- Now , you have to save the version in your Control Version Framework (HitHub).

Practice 0 Face
Exercise 1 – Your First Program (Version 1)

- Open GitHub Desktop and you can see the changes that it has been produced in your template regarding to the last version..



Current repository
arapractice00face-GRyCAPDamian

Current branch
master

Last fetched 6 minutes ago

☑ 2 changed files

☑ Exercise1\exercise1.c

☑ Exercise1\exercise1.exe

Exercise1\exercise1.c

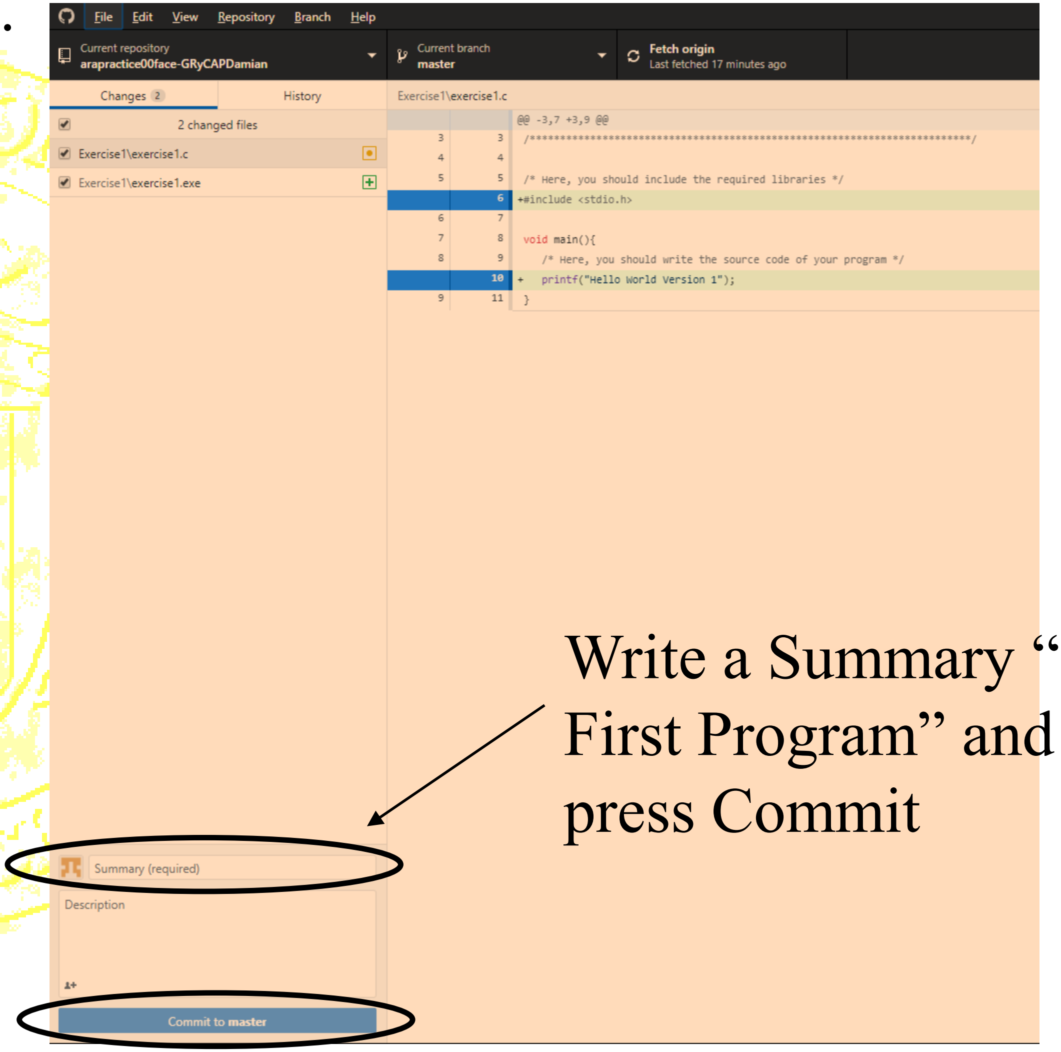
```
@@ -3,7 +3,9 @@
 /*******************************************************************************/

 /* Here, you should include the required libraries */
+#include <stdio.h>

 void main(){
    /* Here, you should write the source code of your program */
+   printf("Hello World Version 1");
 }
```

- You have done changes on your template but they haven't saved at the cloned local repository.

Practice 0 Face

Exercise 1 – Your First Program (Version 1)

- To save the changes to local repository you must press **commit**.



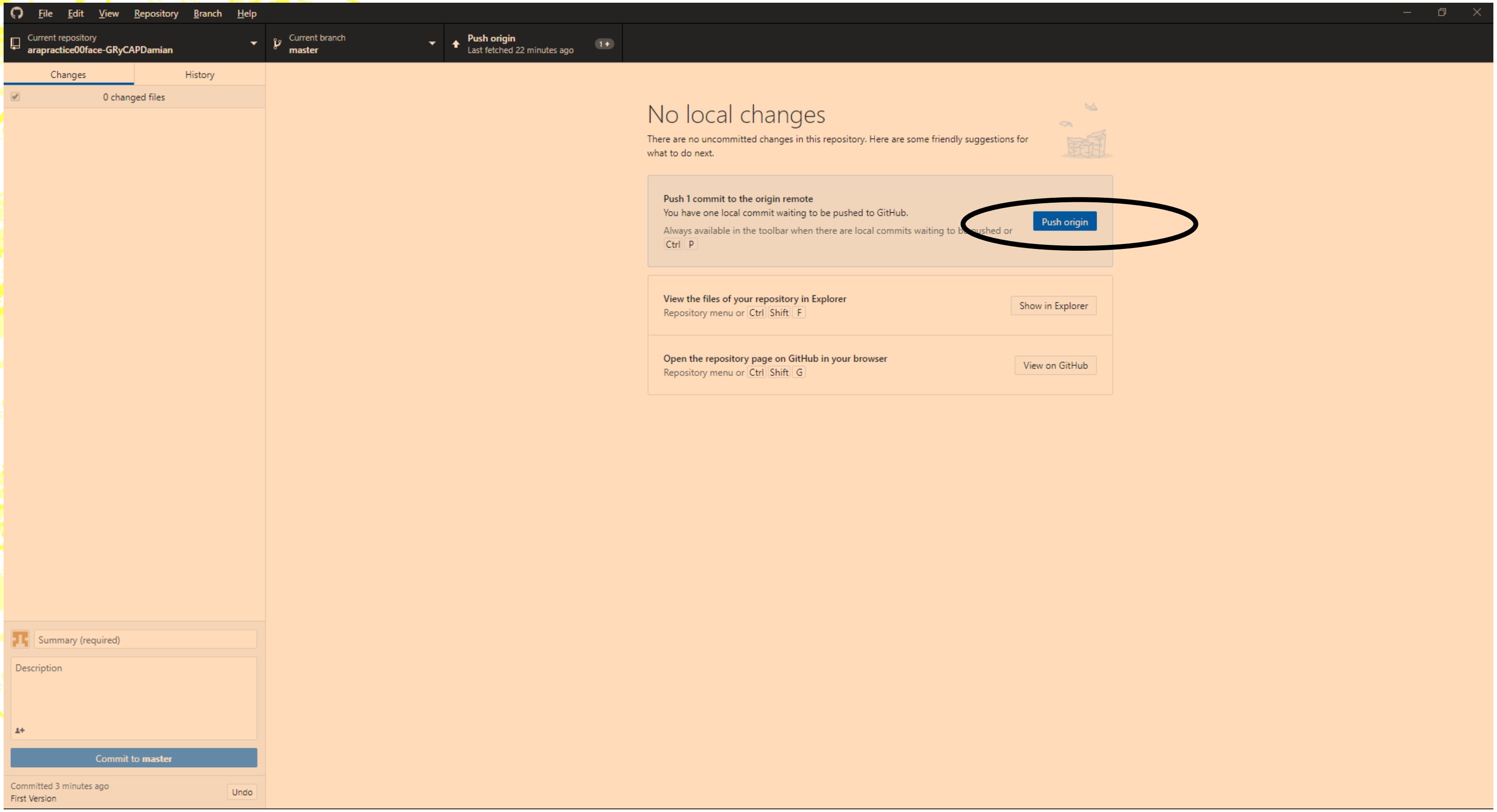
```
@@ -3,7 +3,9 @@
 /*************************************************************************/

 /* Here, you should include the required libraries */
+#include <stdio.h>

 void main(){
    /* Here, you should write the source code of your program */
+   printf("Hello World Version 1");
 }
```

Write a Summary "My First Program" and press Commit

Practice 0 Face

Exercise 1 – Your First Program (Version 1)

- To save the changes to the GitHub repository on the cloud, you must press the “**push origin**” button after the commit.



Committed 3 minutes ago
First Version

No local changes

There are no uncommitted changes in this repository. Here are some friendly suggestions for what to do next.

Push 1 commit to the origin remote
You have one local commit waiting to be pushed to GitHub.
Always available in the toolbar when there are local commits waiting to be pushed or Ctrl P

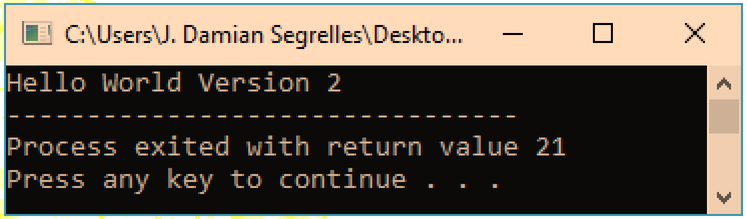
View the files of your repository in Explorer
Repository menu or Ctrl Shift F

Open the repository page on GitHub in your browser
Repository menu or Ctrl Shift G

Practice 0 Face

Exercise 1 – Your First Program (Version 2)

- Open Devc++ and modify the program to show the message "Hello World Version 2".

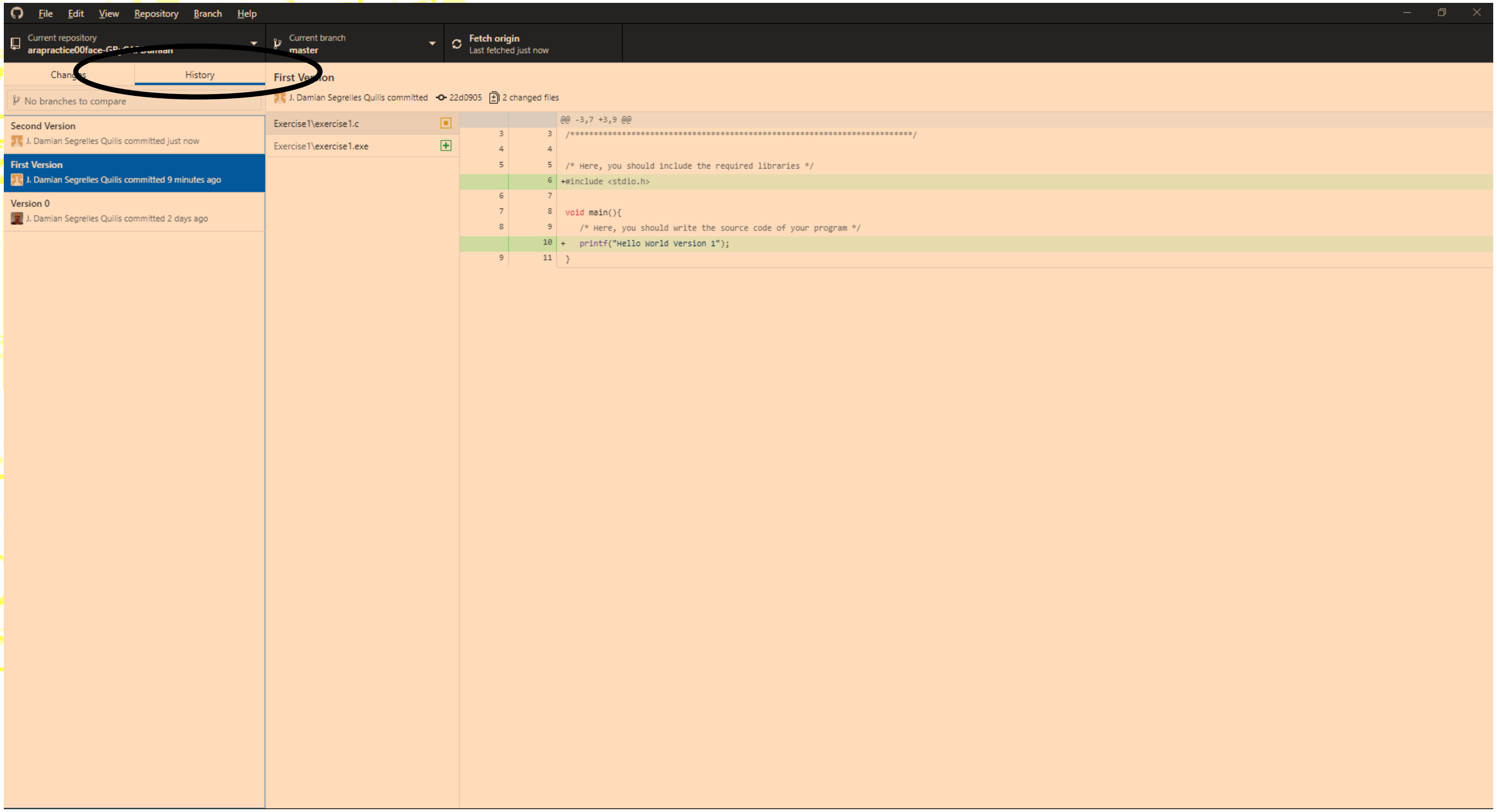


```
Hello World Version 2
--------------------------------
Process exited with return value 21
Press any key to continue . . .
```

- Save in the local repository this new version "Commit" and upload to the repository on the cloud ("Push").

Practice 0 Face
Exercise 1 – Your First Program (Version 2)

- You can consult all version committed at the repository pressing the “History” and rescue old versions.



Current repository
arapractice00face-GP-[illegible] Damian

Current branch
master

Fetch origin
Last fetched just now

No branches to compare

Second Version
J. Damian Segrelles Quilis committed just now

First Version
J. Damian Segrelles Quilis committed 9 minutes ago

Version 0
J. Damian Segrelles Quilis committed 2 days ago

First Version
J. Damian Segrelles Quilis committed 22d0905 2 changed files

Exercise1\exercise1.c
Exercise1\exercise1.exe

```
@@ -3,7 +3,9 @@
 /*****************************************************************************/

 /* Here, you should include the required libraries */
+#include <stdio.h>

 void main(){
    /* Here, you should write the source code of your program */
+   printf("Hello World Version 1");
 }
```

Practice 0 Face

Exercise 2 – Your Second Program

- Design and code in C language a program that it computes the sum of two numbers and show the result on screen.
- When the program works (compile and execute) correctly you must save the program at local repository (commit) and upload to the cloud repository (push) as a Version 1.
- Update the program to sum three numbers. When the program works (compile and execute) , you must save the program at local repository (commit) and upload it to the cloud repository (push) as a Version 2.

Índex

- Software development process
- Version Control system
  - GitHub
    - Registration
    - Your first repository (arapractice00face)
  - GitHub Desktop
    - Installation & Configuration
    - Your first local repository (practice00face clone)
- **Integrated Development Environment**
  - Devc++ IDE Framework
    - Installatatiom & Configuration
- Practice 00 Face
- **Practice 01 Face**
- Practice 01 Autonomous (to do at home)

Practice 1
Face

- Open the task of poliformaT (Practice Lesson 01 face) and create a new repository at your GitHub Account. Next, you clone the repository at your local machine and start to resolve the exercises of the practice lesson 01 (Face).
- The definition of the exercises is located at PoliformaT in the “P1-Basic Sequential Programs (Face).pdf” document.

Índex

- Software development process
- Version Control system
    - GitHub
        - Registration
        - Your first repository (arapractice00face)
    - GitHub Desktop
        - Installation & Configuration
        - Your first local repository (practice00face clone)
- **Integrated Development Environment**
    - Devc++ IDE Framework
        - Installatatiom & Configuration
- Practice 00 Face
- Practice 01 Face
- **Practice 01 Autonomous (to do at home)**

Practice 1

Autonomous (TO DO AT HOME)

- Open the task of poliformaT (Practice Lesson 01 autonomous) and create a new repository at your GitHub Account. Next, you clone the repository at your local machine and start to resolve the exercises of the practice lesson 01 (Autonomous).
- The definition of the exercises is located at PoliformaT in the "P1-Basic Sequential Programs (Autonomous).pdf" document.

Bibliography

- Collins-Sussman, Ben; Fitzpatrick, BW; Pilato, CM (2004), Version Control with Subversion, O'Reilly, ISBN 0-596-00448-6