



III Escuela de Primavera en Investigación de Operaciones

28 al 31 de marzo de 2023

Modalidad Virtual

Julia para cómputo científico con aplicaciones en investigación de operaciones



Jesús Adolfo Mejía de Dios
Rocío Salinas Guerra



Curso de Julia

Episodio 0: Instalación



Agenda

Este episodio está dedicado a la instalación de Julia en Windows*.

1. Descarga
2. Instalación
3. Configuración

Extras:

1. Descarga de editor de código recomendado
2. Instalación de motor de notebooks para Julia

* No somos usuarios de Windows.

Descargar Julia en Linux/Mac

Primero vamos a descargar Julia a través de **JuliaUp**

Desde la terminal:

```
curl -fsSL https://install.julialang.org | sh
```

Al terminar la instalación, Julia estará disponible con el comando: **julia**

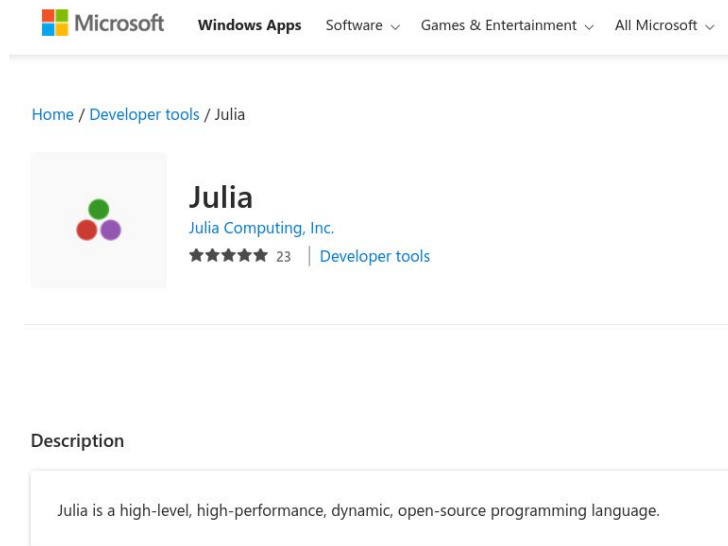
Más información en: github.com/JuliaLang/juliaup

Descargar Julia en **Windows** (recomendado)

Descargue Julia en su versión más actual desde la tienda de Microsoft

Comando:

```
winget install julia -s msstore
```



apps.microsoft.com/store/detail/julia/9NJNWW8PVKMN

Descargar Julia Windows (manualmente)

Primero vamos a descargar Julia en su versión más actual (v1.10.2).

Sitio de descarga:

<https://julialang.org/downloads/>

Descargar Julia (windows)

Seleccionar el sistema operativo (Windows en nuestro caso).

Current stable release: v1.10.2 (March 1, 2024)

Checksums for this release are available in both [SHA256](#) and [MD5](#) formats.

Platform	64-bit	32-bit
Windows [help]	installer portable	installer, portable
macOS x86 (Intel or Rosetta) [help]	.dmg, .tar.gz	
macOS (Apple Silicon) [help]	.dmg, .tar.gz	
Generic Linux on x86 [help]	glibc (GPG) , musl^[1] (GPG)	glibc (GPG)
Generic Linux on ARM [help]	AArch64 (GPG)	
Generic FreeBSD on x86 [help]	.tar.gz (GPG)	

Instalación

The screenshot shows a web browser window at <https://www.julialang.org/downloads/>. The page title is "Download Julia" and it has 40,437 stars on GitHub. The text "Please star us on GitHub. If you use Julia in your project, please add Julia Computing as a dependency." is visible. The "Current stable release:" section indicates that checksums are available for both Windows and macOS. A table lists download links for various operating systems and architectures. A security warning dialog box is overlaid on the page, asking "Do you want to run this file?" for the file "C:\Users\Adolfo\Downloads\julia-1.8.1-win64.exe". The dialog box includes fields for Name, Publisher (JULIA COMPUTING, INC.), Type (Application), and From (C:\Users\Adolfo\Downloads\julia-1.8.1-win64.exe). It has "Run" and "Cancel" buttons. A checkbox "Always ask before opening this file" is checked. A warning icon and text state: "While files from the Internet can be useful, this file type can potentially harm your computer. Only run software from publishers you trust. [What's the risk?](#)"

Download Julia

40,437

Please star us on [GitHub](#). If you use Julia in your project, please add Julia Computing as a dependency.

Current stable release:

Checksums for this release are available in both [Windows](#) and [macOS](#).

Operating System	Download Link
Windows [help]	64-bit (installer), 32-bit (portable)
macOS x86 (Intel or Rosetta) [help]	64-bit (GPG)
macOS ARM (M-series Processor) [help]	64-bit (GPG)
Generic Linux on x86 [help]	64-bit (AArch64) (GPG)
Generic Linux on ARM [help]	64-bit (GPG)
Generic FreeBSD on x86 [help]	64-bit (GPG)
Source	Tarball (GPG) Tarball with dependencies (GPG) GitHub

While files from the Internet can be useful, this file type can potentially harm your computer. Only run software from publishers you trust. [What's the risk?](#)

Run Cancel

Always ask before opening this file

Do you want to run this file?

Name: C:\Users\Adolfo\Downloads\julia-1.8.1-win64.exe

Publisher: JULIA COMPUTING, INC.

Type: Application

From: C:\Users\Adolfo\Downloads\julia-1.8.1-win64.exe

Instalación

The screenshot shows a web browser window at <https://www.julialang.org/downloads/>. The page title is "Download Julia" and it has 40,437 stars on GitHub. The current stable release is 1.8.1. Checksums for this release are available in the background. A table lists download sources for various operating systems: Windows, macOS x86 (Intel or Rosetta), macOS ARM (M-series Processor), Generic Linux on x86, Generic Linux on ARM, Generic FreeBSD on x86, and Source. The Source row shows "Tarball (GPG)", "Tarball with dependencies (GPG)", and "GitHub".

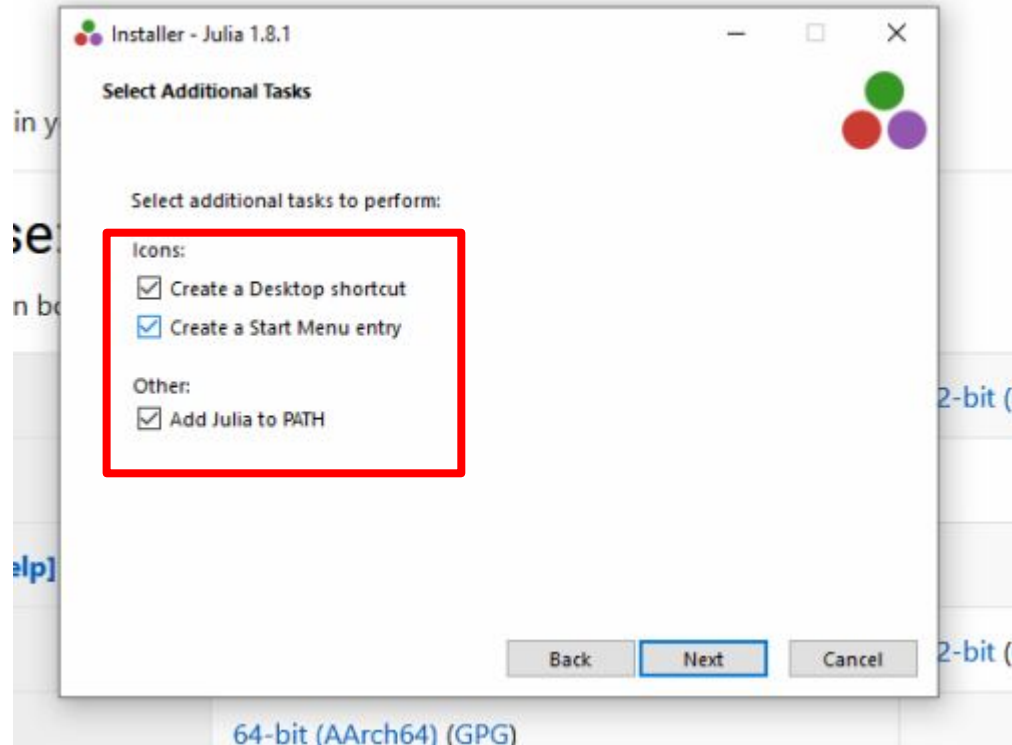
Overlaid on the page is the "Installer - Julia 1.8.1" window. It prompts the user to "Select Installation Directory". The installation directory is set to `C:\Users\Adolfo\AppData\Local\Programs\Julia-1.8.1`. A "Browse" button is next to the text box. Below the text box, it says "Restart installer as Administrator to install Julia system wide". At the bottom, it states "At least 565.4 MB of free disk space is required." and has "Next" and "Cancel" buttons.

Operating System	Download Options
Windows	64-bit (installer), 32-bit (portable)
macOS x86 (Intel or Rosetta)	64-bit (GPG)
macOS ARM (M-series Processor)	64-bit (GPG)
Generic Linux on x86	64-bit (AArch64) (GPG)
Generic Linux on ARM	64-bit (GPG)
Generic FreeBSD on x86	64-bit (GPG)
Source	Tarball (GPG), Tarball with dependencies (GPG), GitHub

Instalación

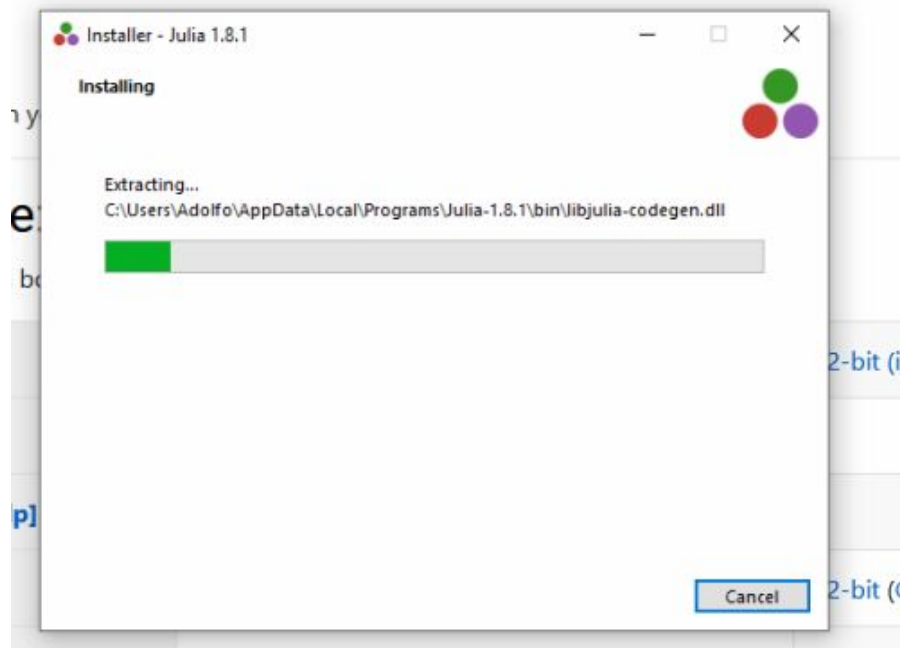
Seleccionar las casillas como en la imagen.

Este paso es importante y nos facilitará la configuración.



Instalación

Darle siguiente, siguiente...



Instalación

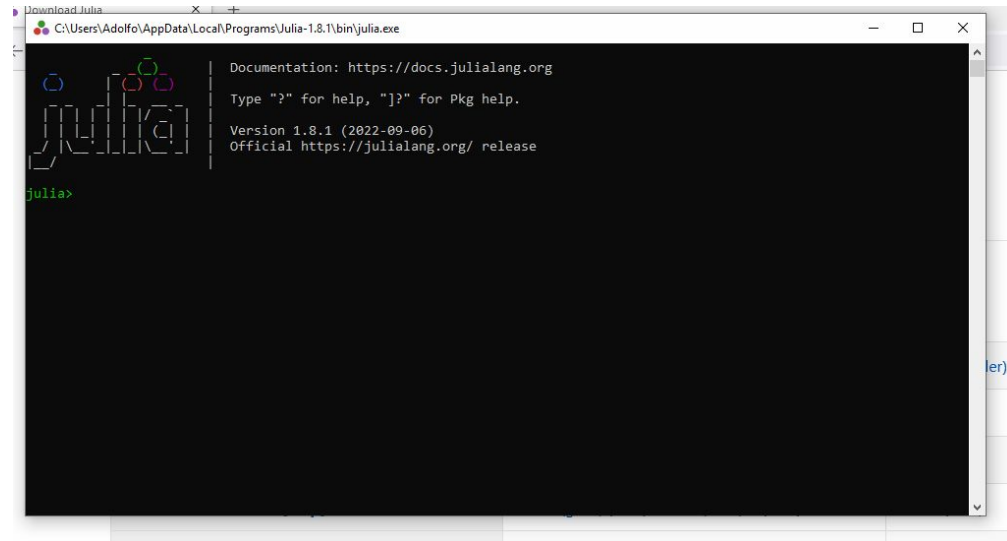
Al finalizar, puede darle a la casilla “Run Julia” para verificar que todo se ha instalado correctamente.



Instalación

Si todo salió bien. Aparecerá la terminal de Julia.

De lo contrario, repetir el proceso.



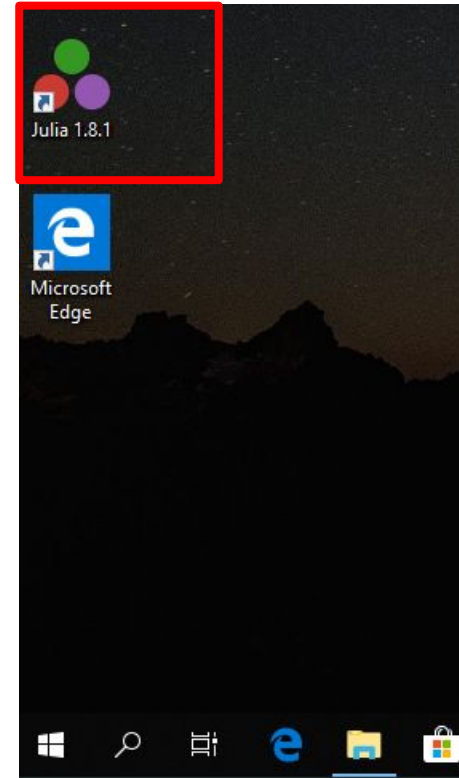
The screenshot shows a Windows terminal window titled "Download Julia". The address bar displays the path "C:\Users\Adolfo\AppData\Local\Programs\Julia-1.8.1\bin\julia.exe". The terminal content includes the Julia logo, documentation link, help instructions, version number (1.8.1), and release date (2022-09-06). The prompt "julia>" is visible at the bottom left.

```
Documentation: https://docs.julialang.org
Type "?" for help, "]?" for Pkg help.
Version 1.8.1 (2022-09-06)
Official https://julialang.org/ release

julia>
```

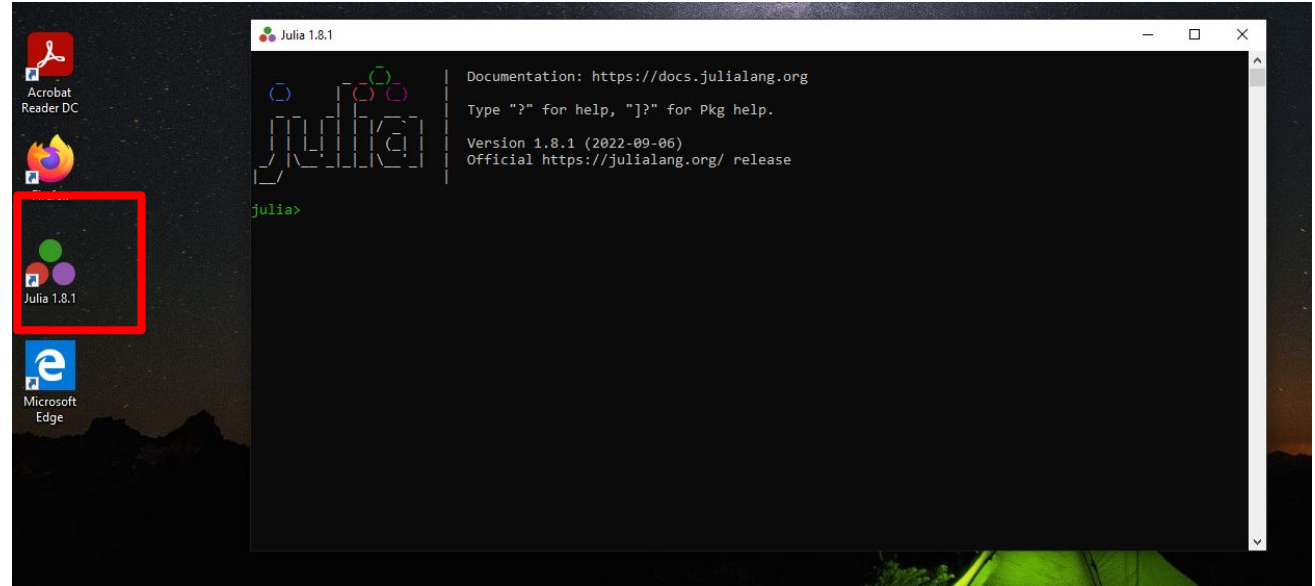
Instalación

Le aparecerá el ícono de Julia en el escritorio.



Instalación

Al darle doble-click, se abrirá la consola de Julia.





Entornos de desarrollo



Editor de código: Instalación

Ahora vamos a instalar el editor de código que recomiendo por su popularidad. Éste se llama Visual Studio Code.

Sitio de descarga:

<https://code.visualstudio.com/>

Editor de código: Instalación

Descarga:

The image shows the Visual Studio Code website and the IDE interface. The website header includes the Visual Studio Code logo and navigation links: Docs, Updates, Blog, API, Extensions, FAQ, Learn. A search bar and a 'Download' button are also present. A banner for 'Version 1.88' is visible. The main content area features the text 'Code editing. Redefined.' and 'Free. Built on open source. Runs everywhere.' Below this is a table of download links for various operating systems and architectures. The 'Windows x64' row is highlighted with a red box. To the right, a screenshot of the Visual Studio Code IDE is shown, displaying the 'EXTENSIONS MARKETPLACE' sidebar with a list of installed and available extensions, the main editor window showing a JavaScript file named 'blog-post.js', and the 'PROBLEMS' and 'TERMINAL' panels at the bottom.

Visual Studio Code

Docs Updates Blog API Extensions FAQ Learn

Search Docs Download

Version 1.88 is now available! Read about the new features and fixes from March.

Code editing. Redefined.

Free. Built on open source. Runs everywhere.

	Stable	Insiders
macOS	Universal	
Windows x64	User Installer	
Linux x64	.deb .rpm	

Other downloads or open on web

Visual Studio Code IDE Interface:

- File Edit Selection View Go Debug Terminal Help
- EXTENSIONS MARKETPLACE: @sortinstalls
- Python 2019.2.41221 55.9M 4.5
- GitLens — Git super... 9.9.2 25.3M 5
- C/C++ 0.24.1 24.2M 3.5
- ESLint 1.9.0 22.1M 4.5
- Debugger for Chr... 4.11.7 21.4M 4
- Language Supp... 0.47.0 19.3M 4.5
- VSCode Icons 9.2.0 18.6M 5
- Vetur 0.21.1 17.3M 4.5
- C# 1.21.0 16.4M 4

blog-post.js - gatsby-graphiql-app - Visual Studio Code - Insiders

```
src > components > JS blog-post.js > <function> > @blogPost
1 import { graphql } from "gatsby"
2 import React from "react"
3 import Image from "gatsby-image"
4
5 export default ({ data }) => {
6   const blogPost = data.cms.blogPost
7   return (
8     <div>
9       (blogPost) <debugger>
10      blogPost <decodeURI>
11      <Image> <decodeURIComponent>
12    ) <div>
13      <h1>(blogPost) <defaultStatus>
14      <div> <Post> <delete>
15      <div> <danger> <deleteFocus>
16      <div> <devicePixelRatio>
17    </div>
18  )
19 }
20
```

PROBLEMS TERMINAL

Info 1 fwmj: Compiling... DONE Compiled successfully in 79ms

Info 1 fwmj: Info 1 fwmj: Compiled successfully.

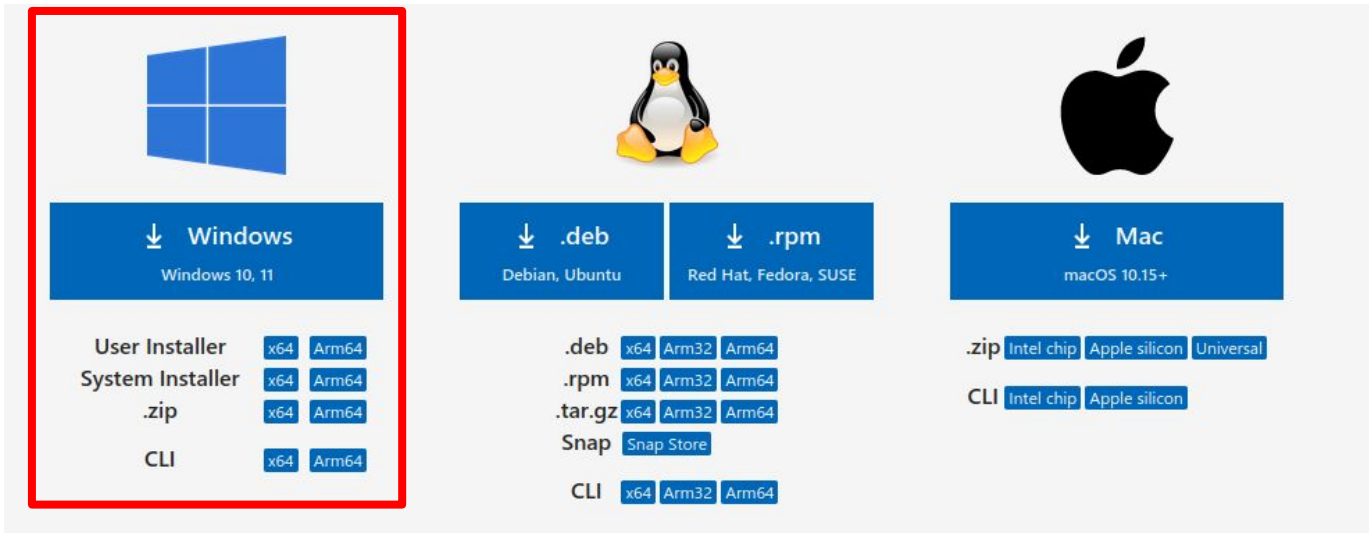
Ln 6, Col 21 Spaces: 2 UTF-8 LF JavaScript

Editor de código: Instalación

Descarga:

Download Visual Studio Code

Free and built on open source. Integrated Git, debugging and extensions.

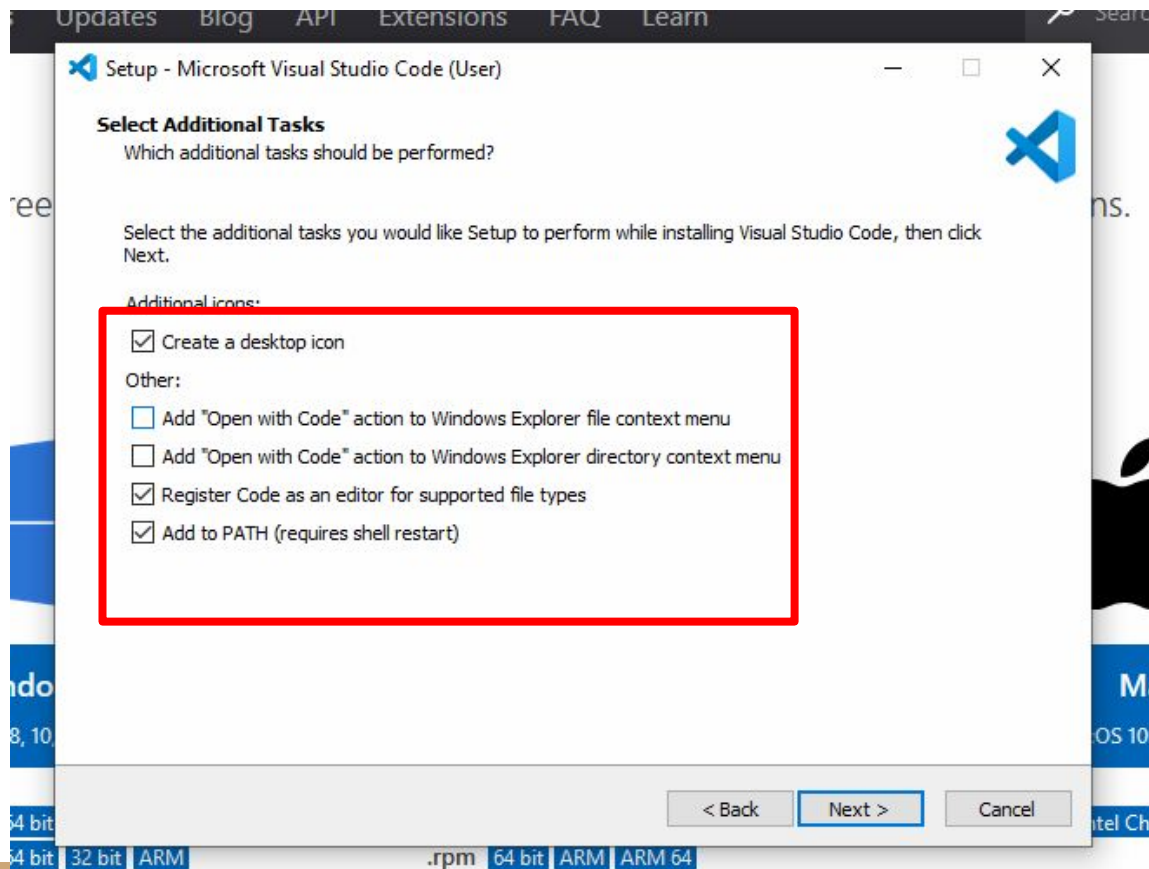


The screenshot displays the Visual Studio Code download page. The Windows section is highlighted with a red border. It shows the Windows logo and a blue button labeled 'Windows' with a download icon and 'Windows 10, 11'. Below this, a list of installation methods is provided: User Installer, System Installer, .zip, and CLI. Each method has two buttons for 'x64' and 'Arm64' architectures. The Linux section features the Tux penguin logo and two blue buttons for '.deb' (Debian, Ubuntu) and '.rpm' (Red Hat, Fedora, SUSE). Below these are links for various package formats: .deb, .rpm, .tar.gz, Snap, and CLI, each with 'x64', 'Arm32', and 'Arm64' options. The Mac section shows the Apple logo and a blue button labeled 'Mac' for 'macOS 10.15+'. Below it are links for '.zip' (Intel chip, Apple silicon, Universal) and 'CLI' (Intel chip, Apple silicon).

Platform	Architecture	Installation Method
Windows	x64	User Installer
	Arm64	User Installer
	x64	System Installer
	Arm64	System Installer
	x64	.zip
	Arm64	.zip
	x64	CLI
	Arm64	CLI
Linux	x64	.deb
	Arm32	.deb
	Arm64	.deb
	x64	.rpm
	Arm32	.rpm
	Arm64	.rpm
	x64	.tar.gz
	Arm32	.tar.gz
	Arm64	.tar.gz
	x64	Snap
	Arm32	Snap
	Arm64	Snap
Mac	Intel chip	.zip
	Apple silicon	.zip
	Universal	.zip
	Intel chip	CLI
Apple silicon	CLI	

Editor de código: Instalación

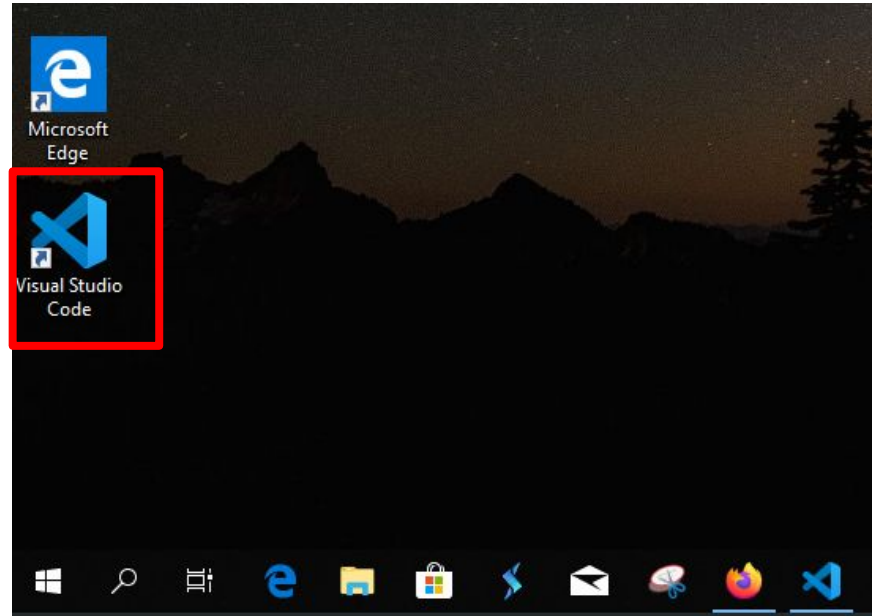
Seleccione las casillas.



Editor de código: Instalación

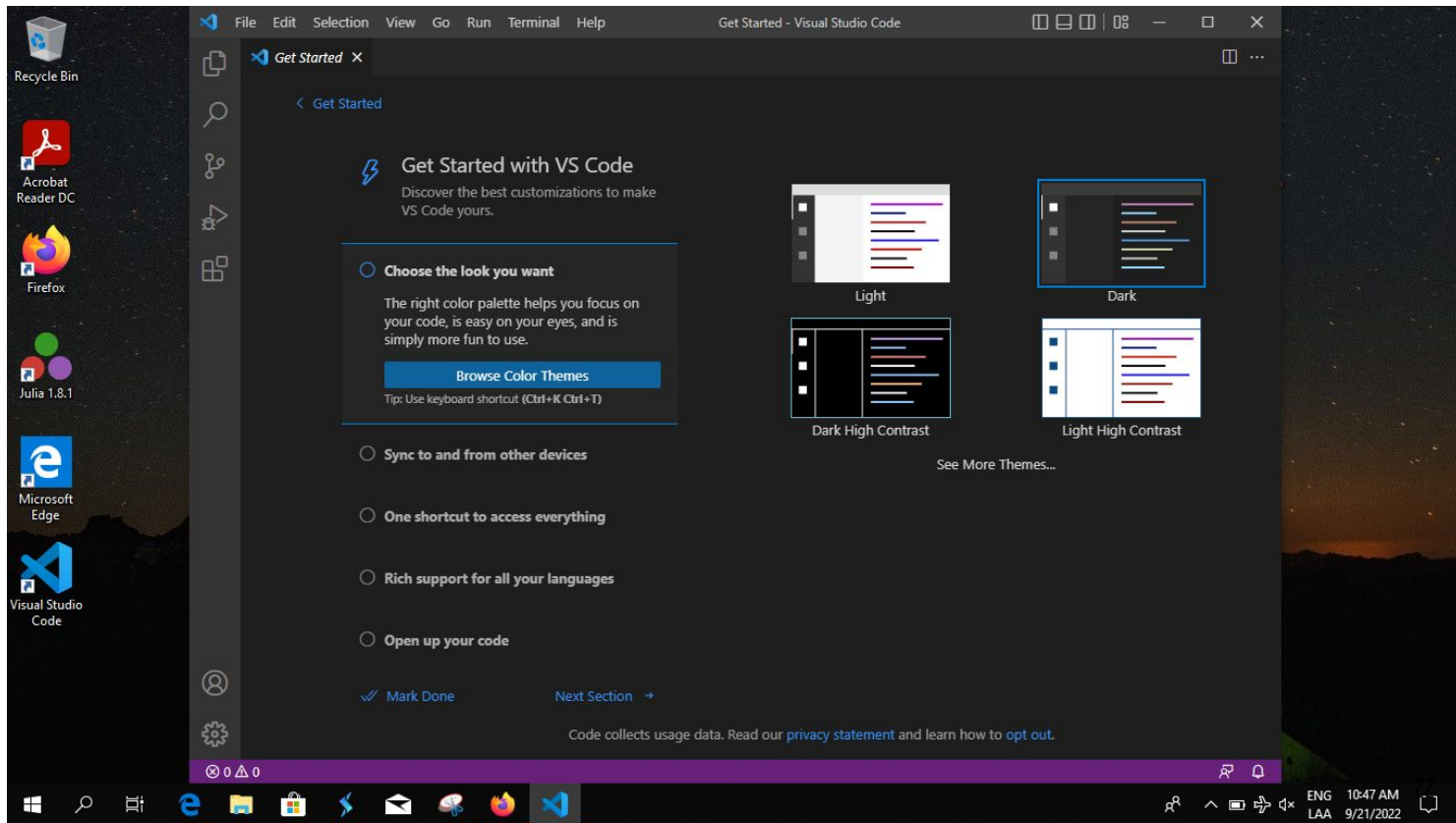
Una vez instalado,
aparecerá el ícono
en su escritorio.

Úselo para abrir el
editor.



Editor de código: Configuración

Editor:

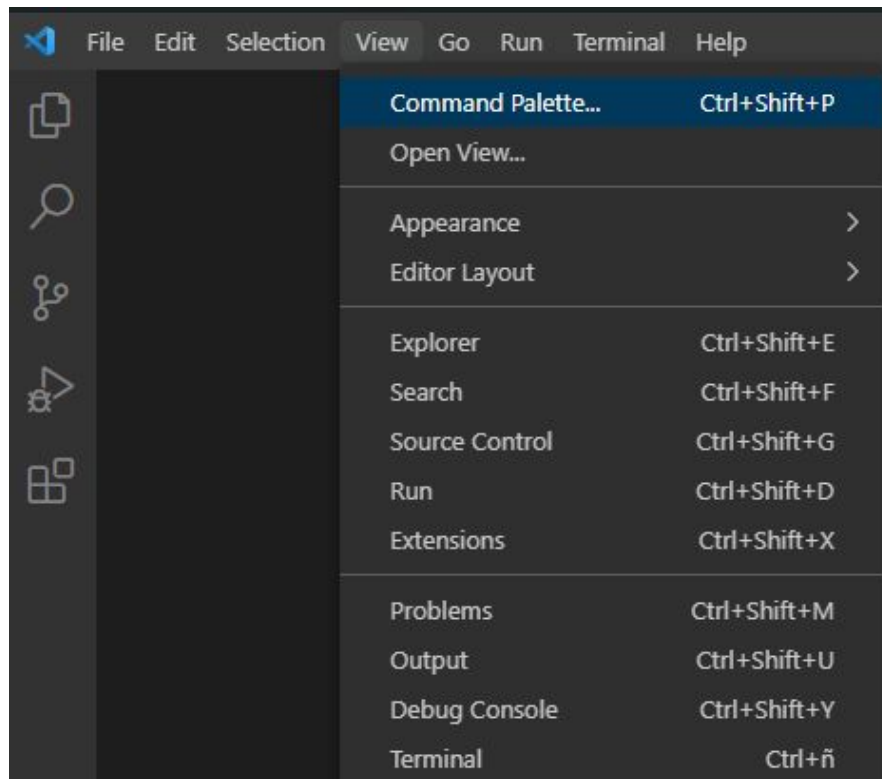


Editor de código: Configuración

Vamos a hacer que el editor se comuniqué con Julia.

Primero, vaya a

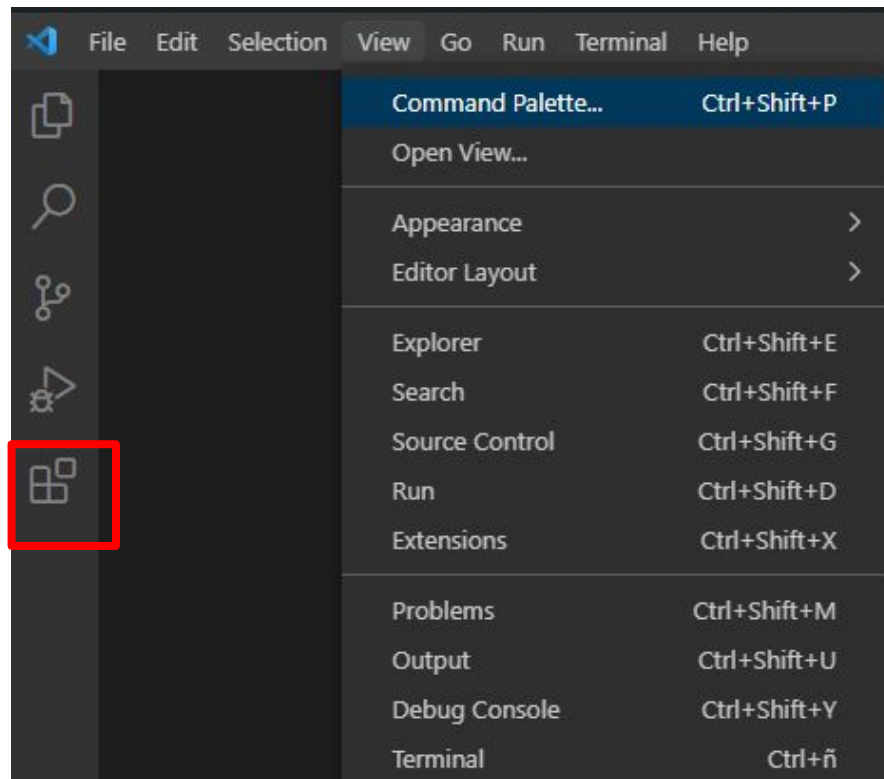
Ver → Paleta de comandos



Editor de código: Configuración

Busque el término “Instalar” o “Install” si está en inglés y darle enter.

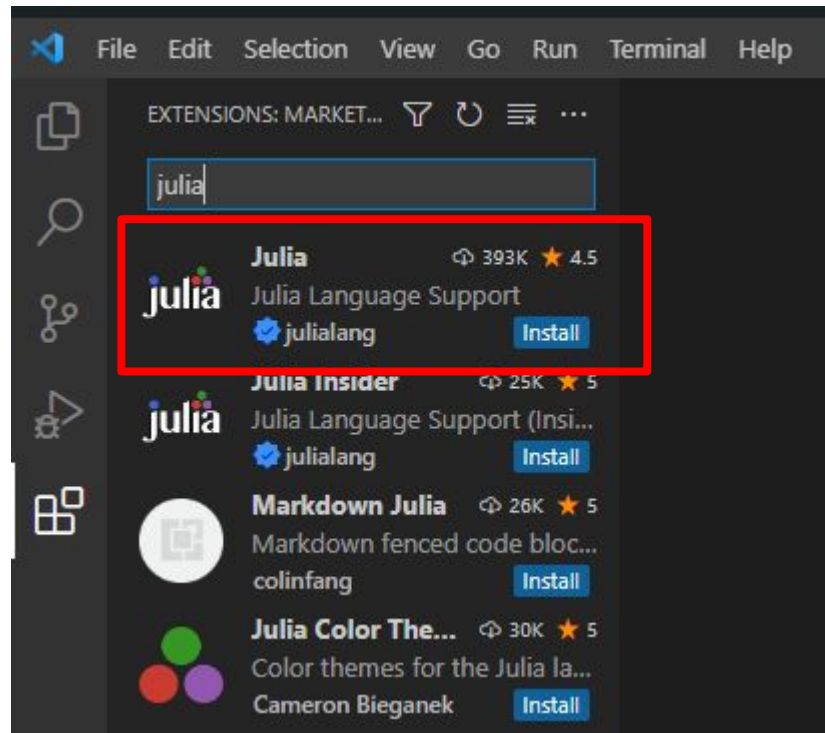
También puede hacer click en el ícono indicado en rojo.



Editor de código: Configuración

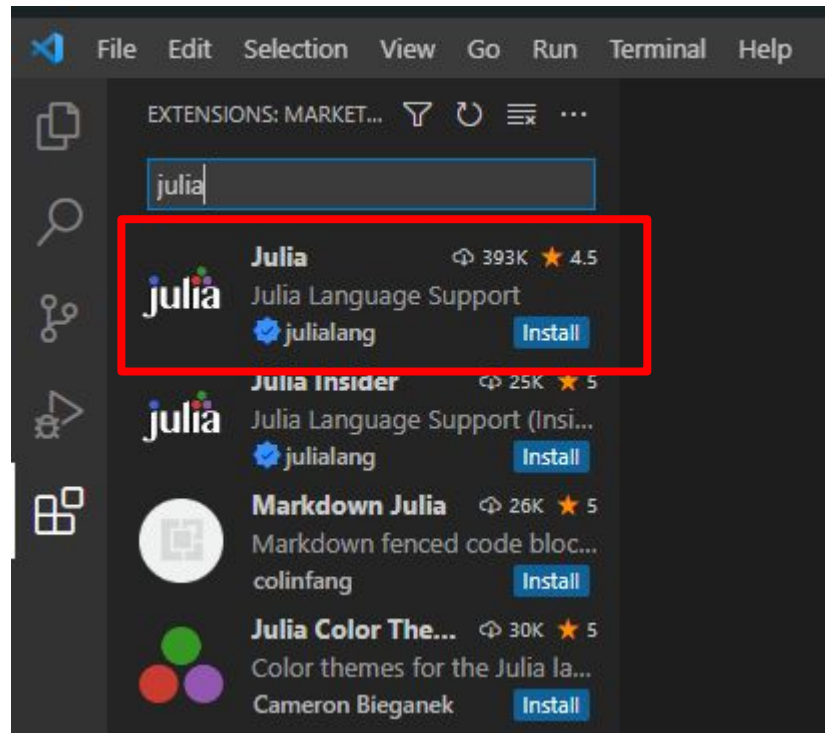
Únicamente instalará lo indicado en **rojo**.

No instale nada más, a menos que tenga experiencia usando el editor.



Editor de código: Configuración

Listo, ahora tiene instalado y configurado un entorno para trabajar con Julia.



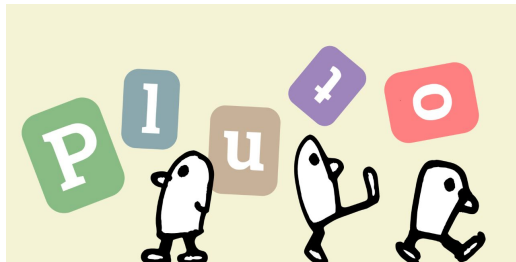
Notebooks

Notebooks: Explicación

Existen diferentes motores de notebooks, entre los más populares se encuentra Jupyter.



Sin embargo, este tiene varias debilidades que le hereda a Julia. Por esta razón, la comunidad de Julia propuso un sistema de notebooks reactivo llamado **Pluto.jl**.

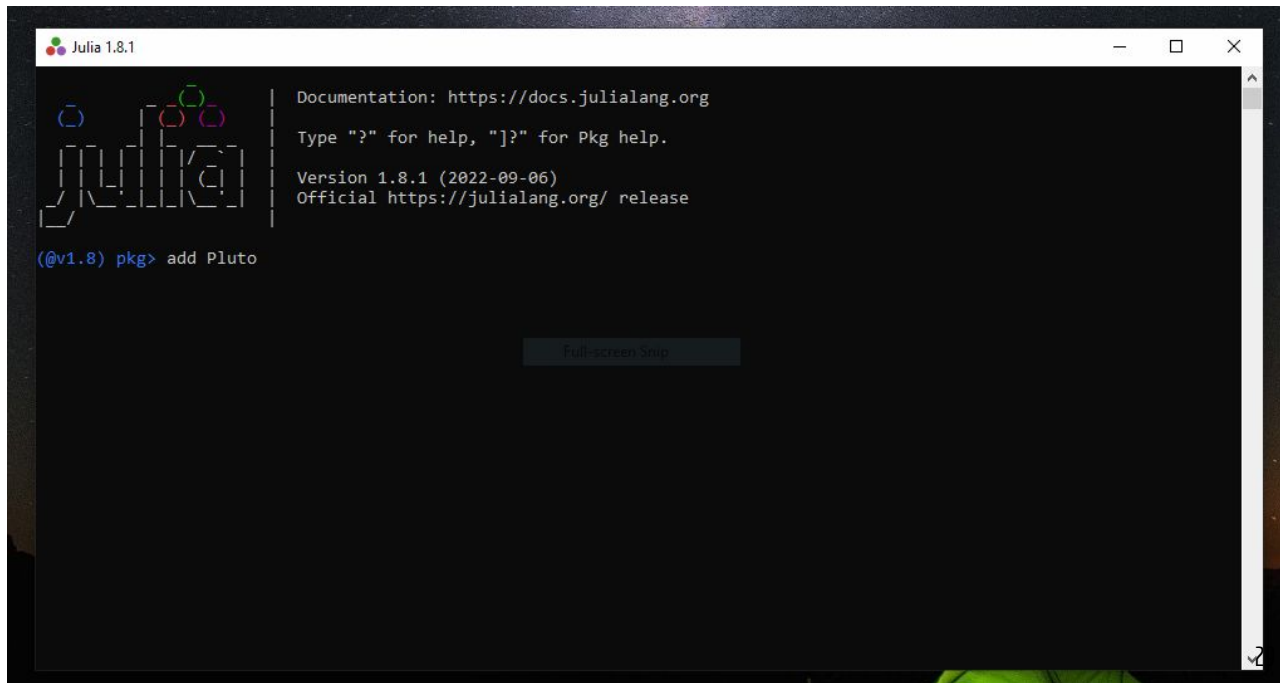


Notebooks: Instalación

Abrir la consola y escribir: **add Pluto**

Luego dar *enter*.

Importante: Debe escribir el símbolo “**]**”

A screenshot of the Julia REPL console window. The window title is "Julia 1.8.1". On the left, there is a stylized logo of the word "julia" in a grid-like font. The main area of the console shows the following text: "Documentation: https://docs.julialang.org", "Type '?' for help, ']' for pkg help.", "Version 1.8.1 (2022-09-06)", and "Official https://julialang.org/ release". At the bottom, the prompt "(@v1.8) pkg>" is followed by the command "add Pluto". A "Full-screen Snap" button is visible at the bottom center of the console area.

```
Julia 1.8.1

Documentation: https://docs.julialang.org
Type "?" for help, "]" for pkg help.
Version 1.8.1 (2022-09-06)
Official https://julialang.org/ release

(@v1.8) pkg> add Pluto
```

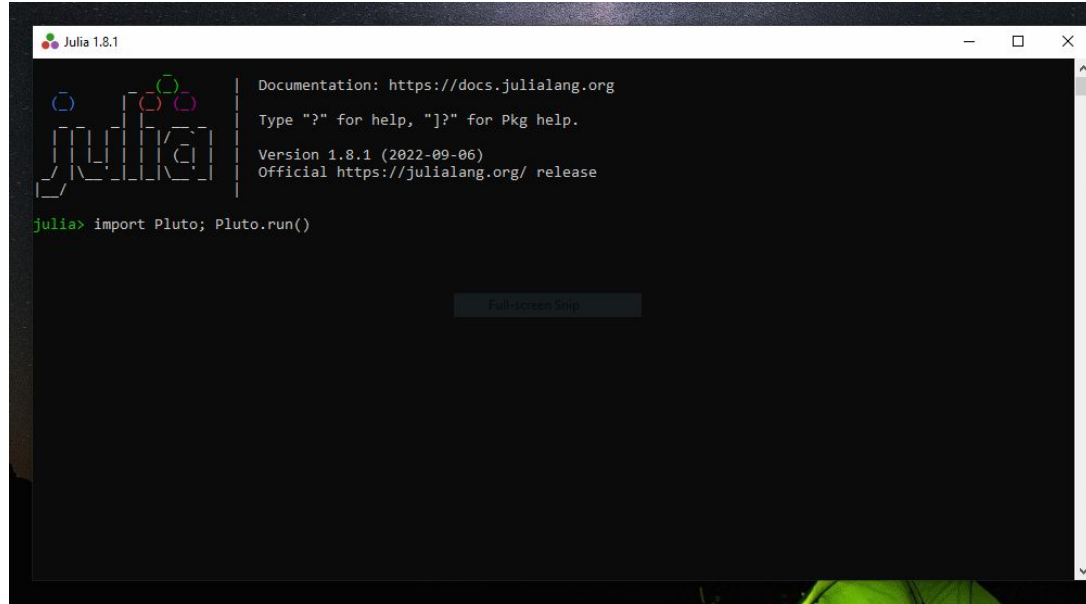
Notebooks: Inicio

Una vez instalado, borre todo hasta que aparezca: **julia>**

Para iniciar Pluto, escriba el comando:

```
import Pluto; Pluto.run()
```

Note las mayúsculas y minúsculas.



Notebooks: Inicio

welcome to **Pluto.jl** 

My work

Full-screen Snip

+ *Create a new notebook*

Open a notebook

Enter path or URL...

Open



Aquí inicia nuestra historia con Julia

