

## Installation

Unzip the FALCON folder and put it on the Desktop.

### 1. step - RHINO

You can download **evaluation version of Rhino 7** from the following page:

<https://www.rhino3d.com/download/rhino-for-windows/evaluation/>

← → ↻ 🏠 rhino3d.com/download/rhino-for-windows/evaluation/ 🔍 🌐 📄 🌟

**Rhino**  
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### Download Rhino 7 for Windows Evaluation

September 24, 2023 | 292.8 MB [Read Change Log](#)

This is the **one-time evaluation** version. Saving and plug-ins stop working 90 days after you download, unless you **purchase**.  
(After 90 days, it will still work great to **learn Rhino** and to **view Rhino** and many other file formats.)

**Buy a license here.** Want to try Rhino for Mac instead?

**Requirements:**

- 64-bit Windows 11, 10, or 8.1.
- [Details...](#)

**Login or Create a Rhino Account to Download**

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[f](#) [t](#) [in](#) [v](#) [e](#) [m](#)

After clicking the link and creating an account on the Rhinoceros website there should appear a License Key for a one-time evaluation version after ticking to agree to the Privacy Policy. Go ahead and download the software.

### Download Rhino 7 for Windows Evaluation

24. rujna 2023. | 292.8 MB

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#### Requirements:

- 64-bit Windows 11, 10, or 8.1.
- [Details...](#)

I agree to McNeel's Privacy Policy

Use the following Rhino 7 For Windows Evaluation license key to install

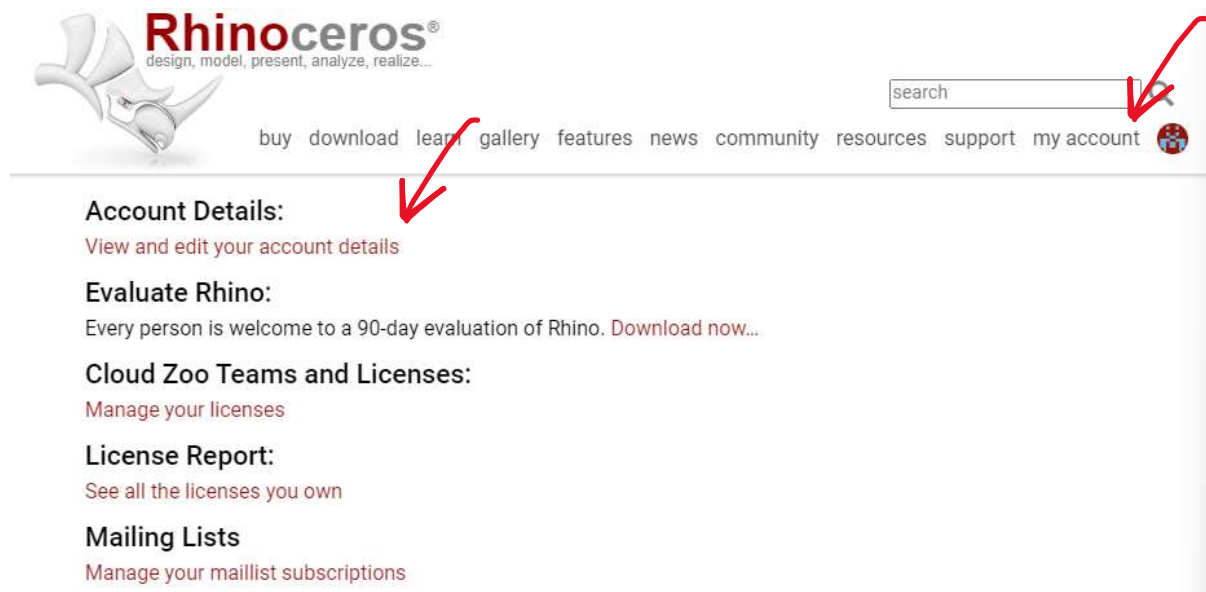
Expires: 20. 01. 2024

**Download English Now**

- OR -

Select another language

By clicking on my account a tab opens where account details are visible.



After opening Account Details go to Licenses then Personal Licenses and Add License. There you can enter the License Key given in the last step.

## My Account

Emails	Add and remove personal emails associated with your account.	>
Personal Info	View and modify your personal information.	>
Login	Change your password, linked accounts, and other settings.	>
Teams	View and modify the teams you belong to.	>
Permissions	View and modify permissions you've given to apps.	>
Licenses	View, add, and remove licences associated with your account.	>

## Add License to Cloud Zoo

Add license to

License Key

[Where is my license key?](#)

You will be able to use this license on any device with semi-regular internet access.

Upon opening Rhino7 login with the created account to activate the License Key.

Licensing (7.34.23267.11001, 2023-09-24) X


### Welcome to Rhino

 Enter your email to get started:

I have read and agree to:

- 1. [Rhino End User License Agreement](#)
- 2. [The McNeel Privacy Policy](#)

Licensing (7.34.23267.11001, 2023-09-24) X

 Your evaluation is ready!  
Login to use it.

or

[Options](#)

## Validation Completed Successfully



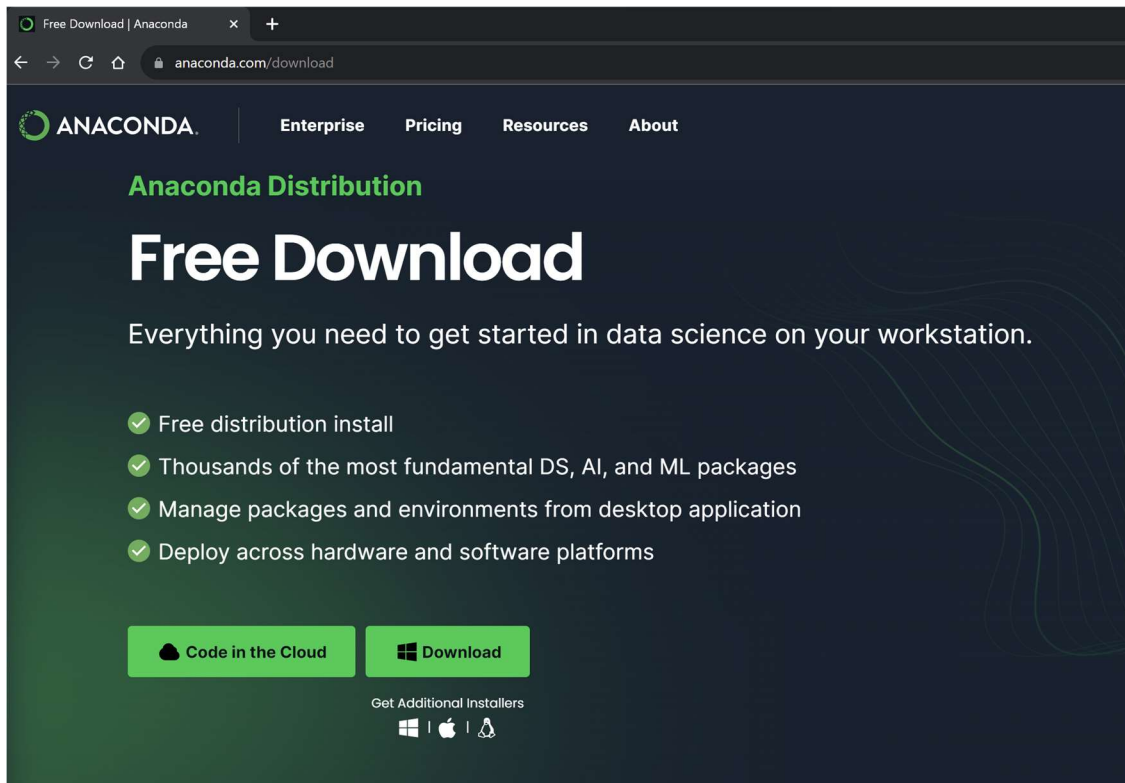
Thank you. Your license has been successfully validated.

Close

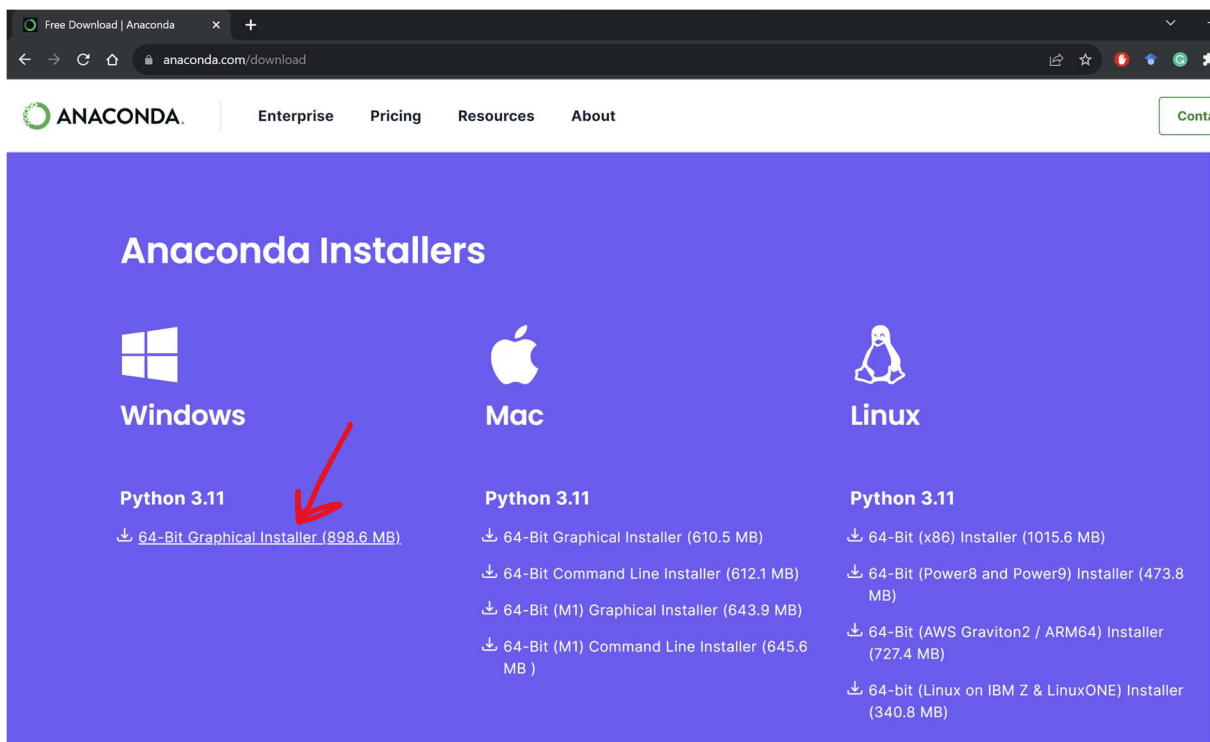
## 2. step – ANACONDA 3

To be able to use FALCON components for form-finding in Grasshopper you need Anaconda 3.

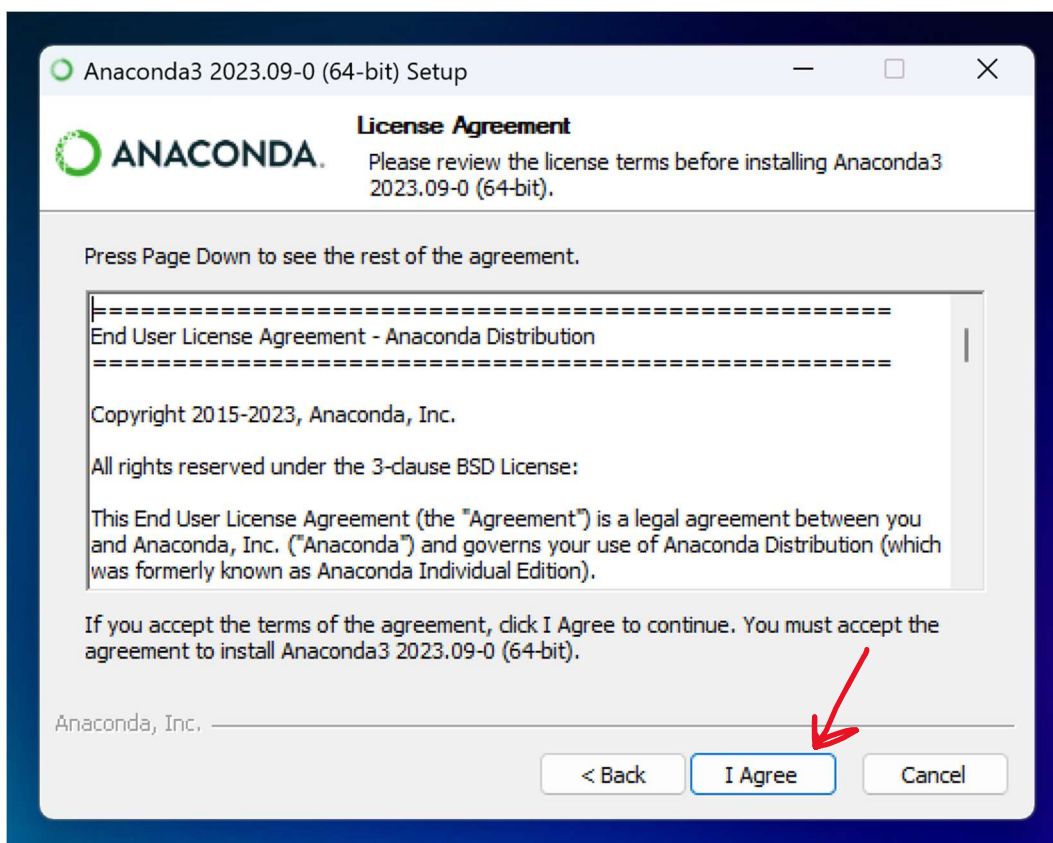
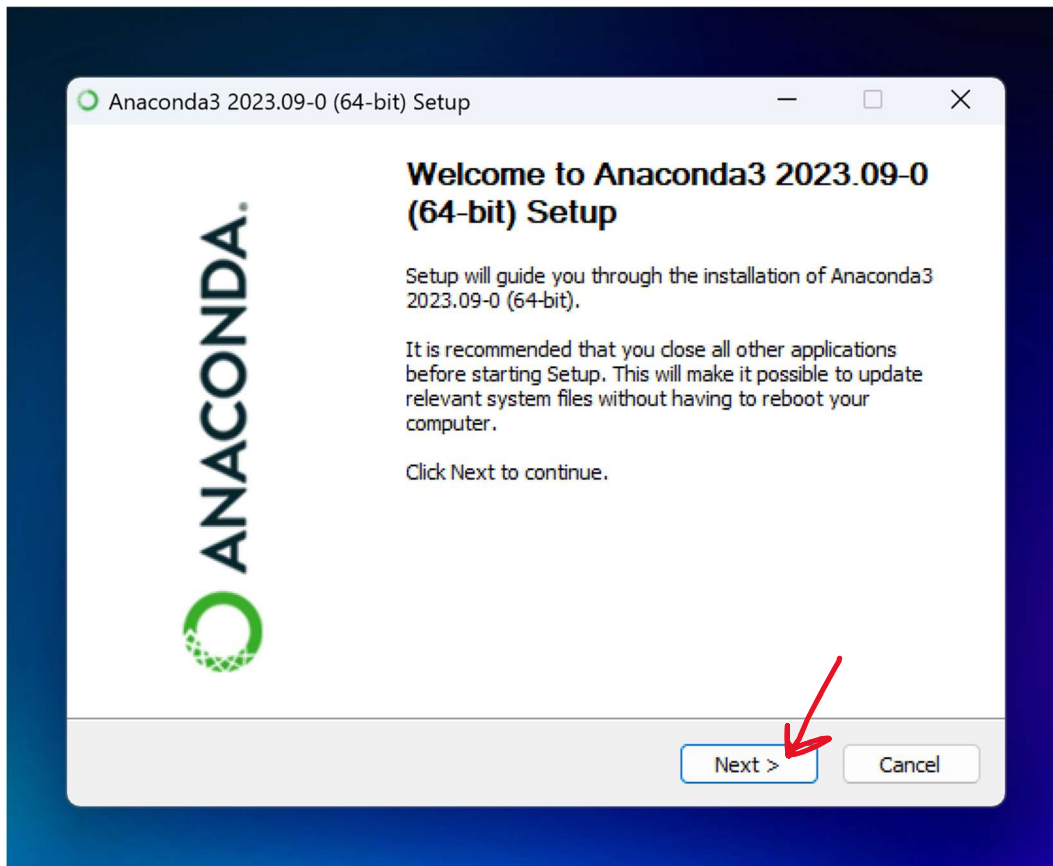
You can install Anaconda from the following link: <https://www.anaconda.com/products/individual>.

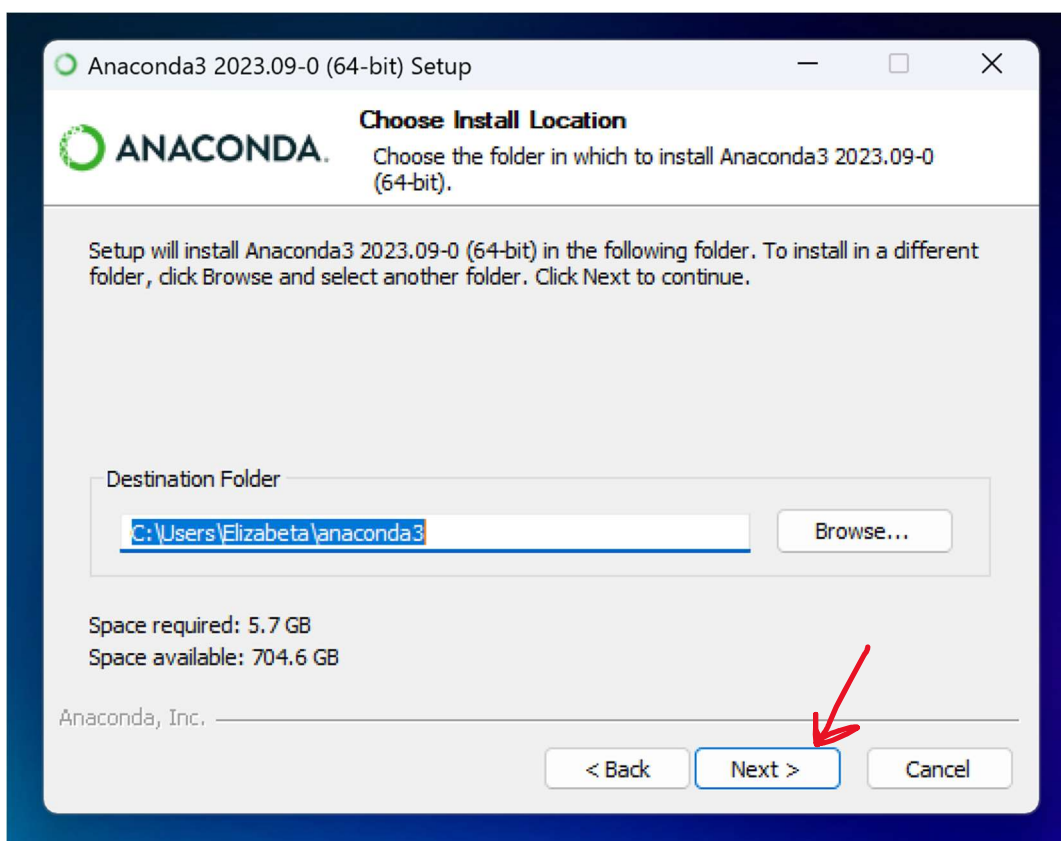
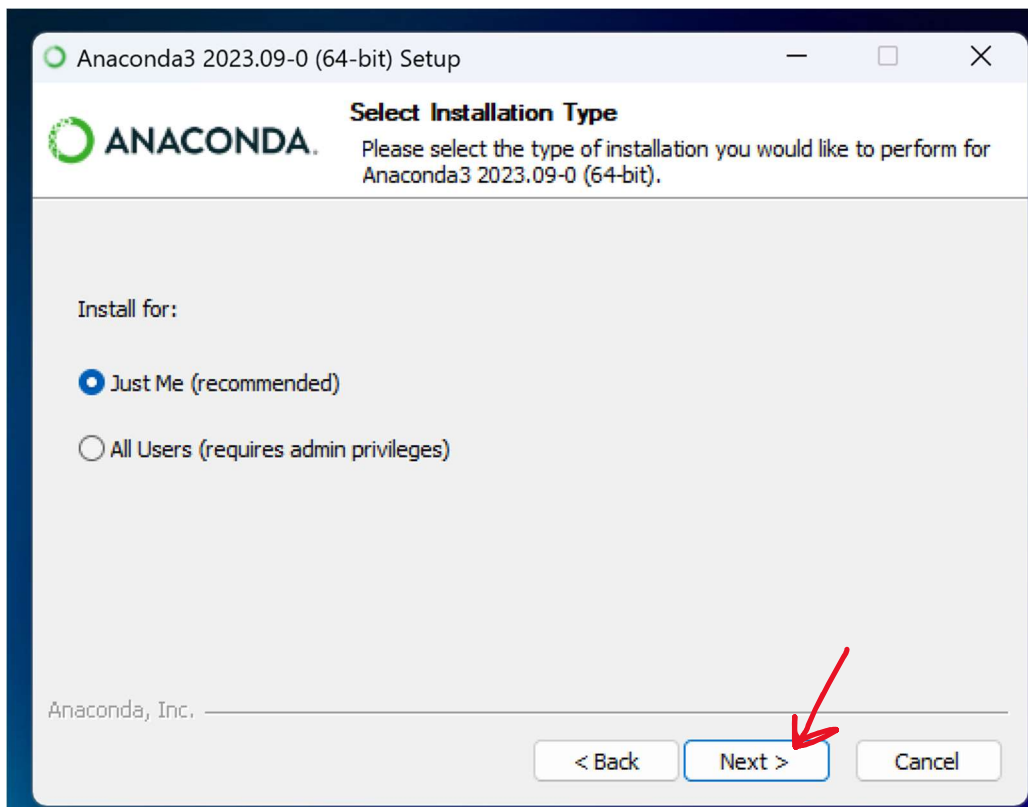


Download **Installer** from the **bottom of the page**, and it will guide you through the installation process.

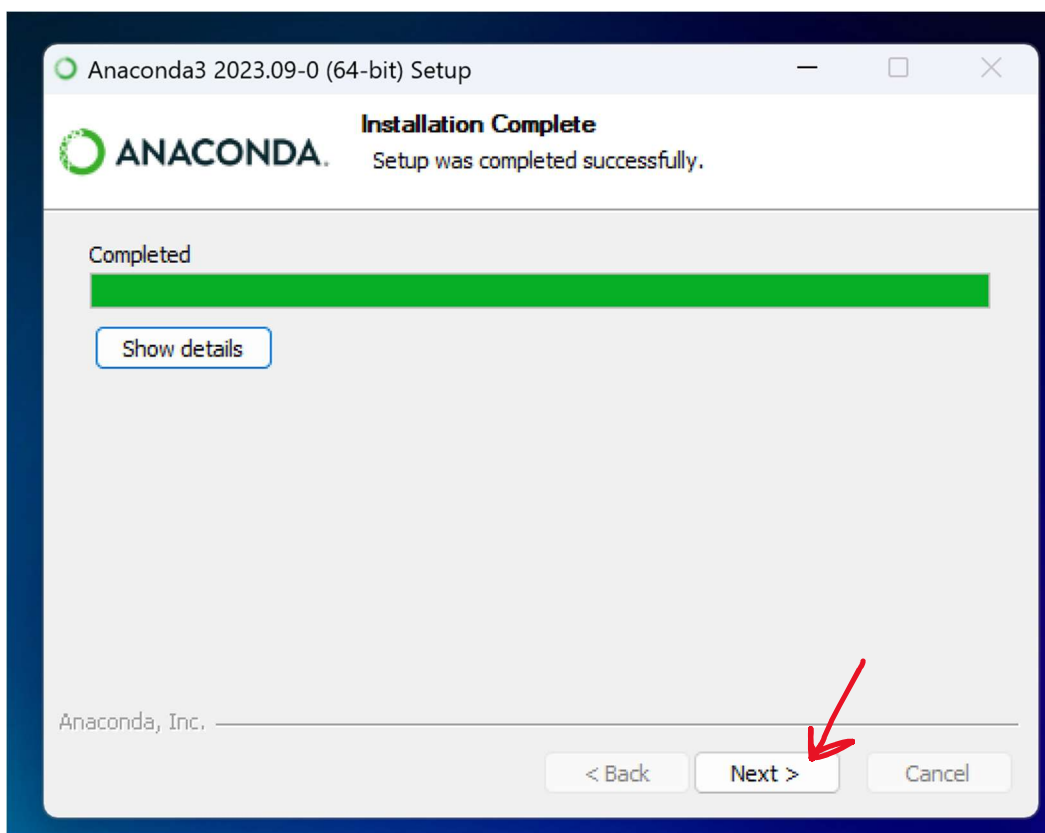
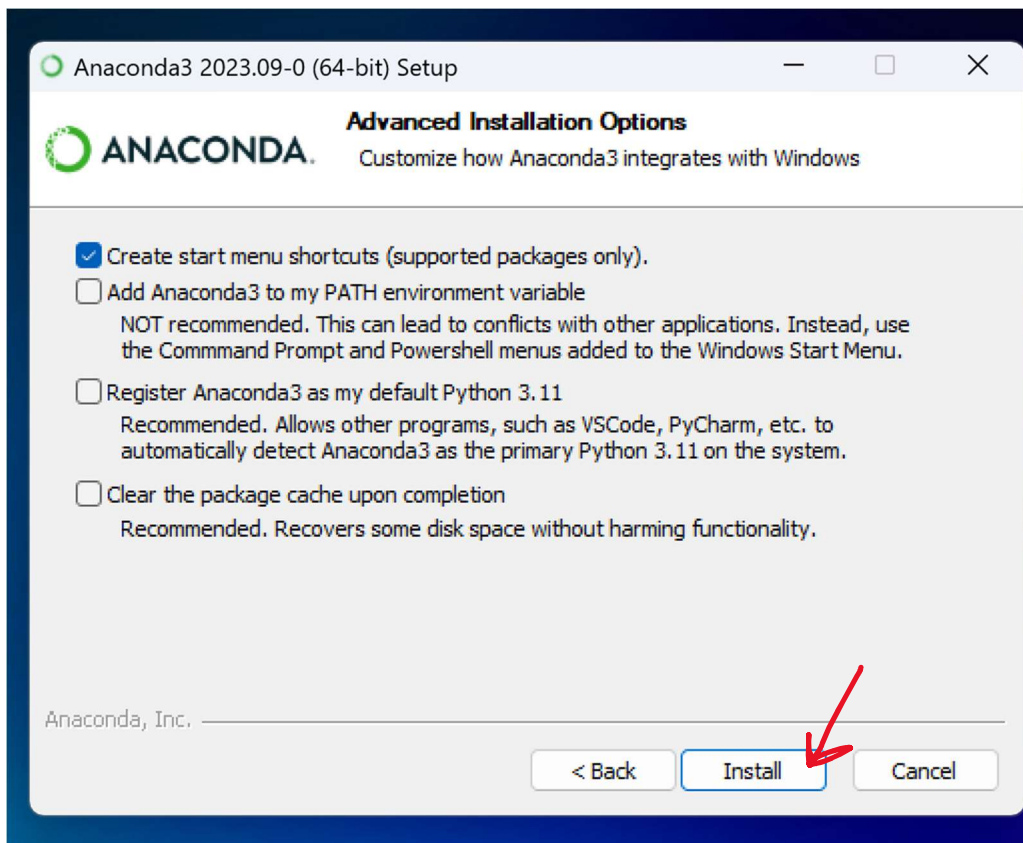


Open downloaded .exe file and it will guide you through the installation process as shown in pictures below.

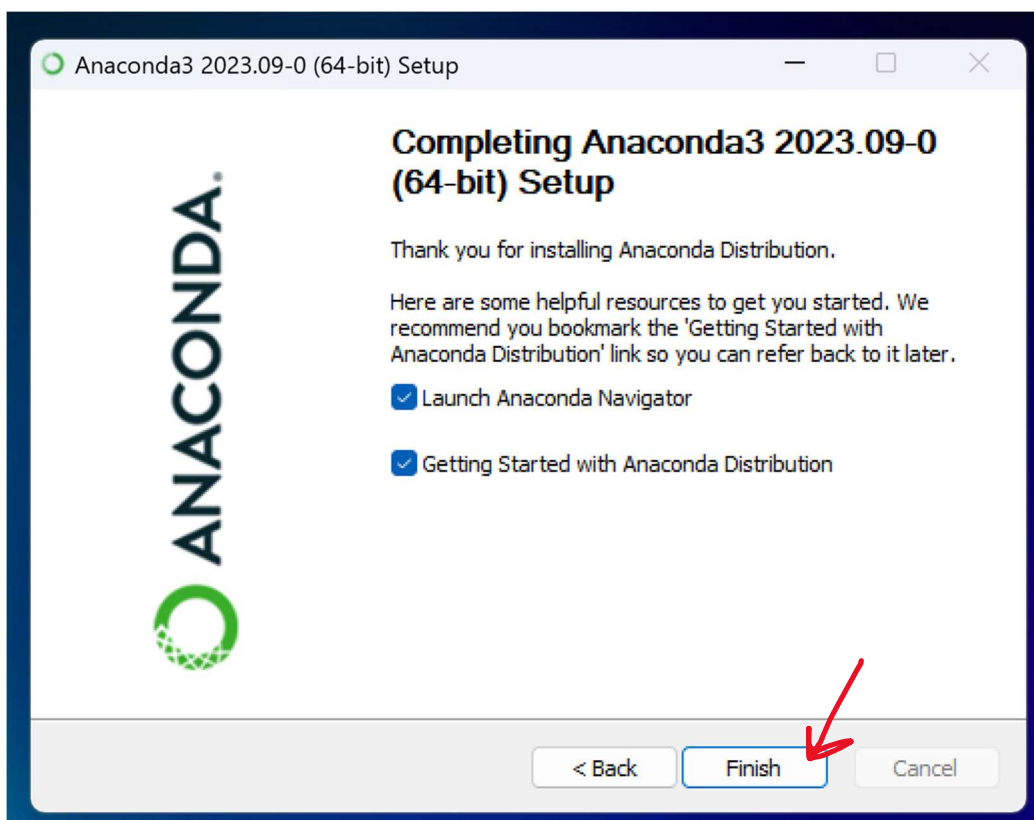
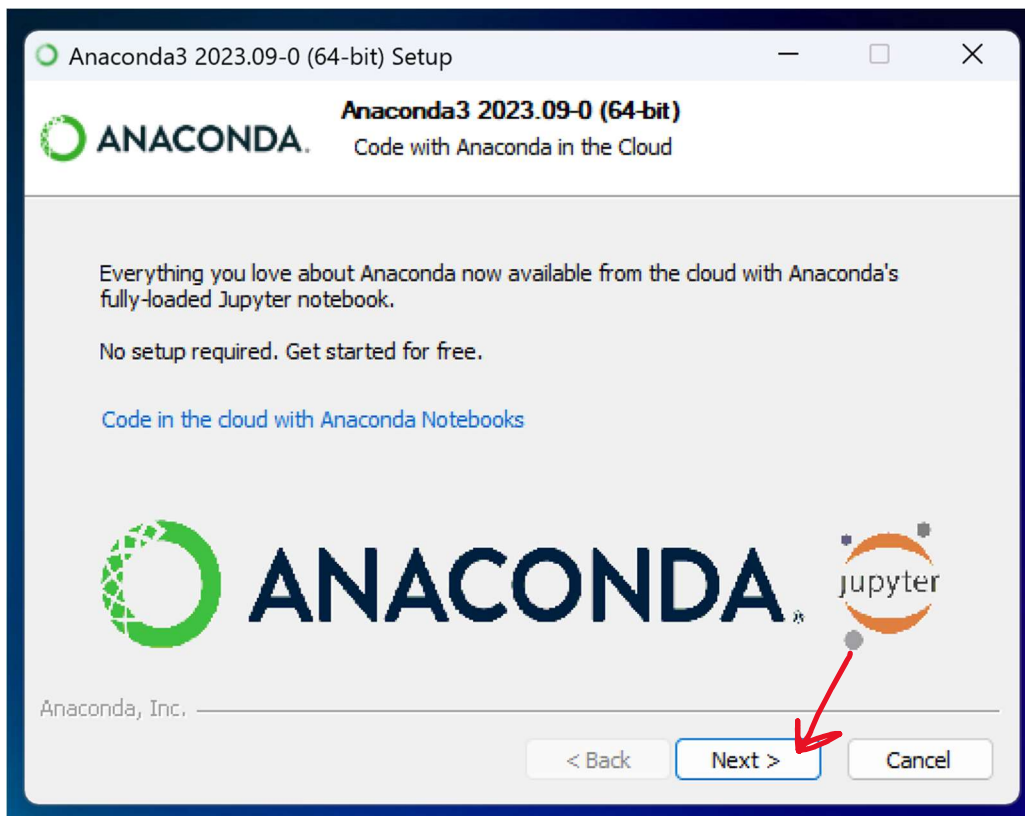




Destination folder is given to you automatically. I suggest you don't change it. You will need this path later to be able to locate anaconda on your computer so you can make a copy of it for later (e.g. paste in Word).







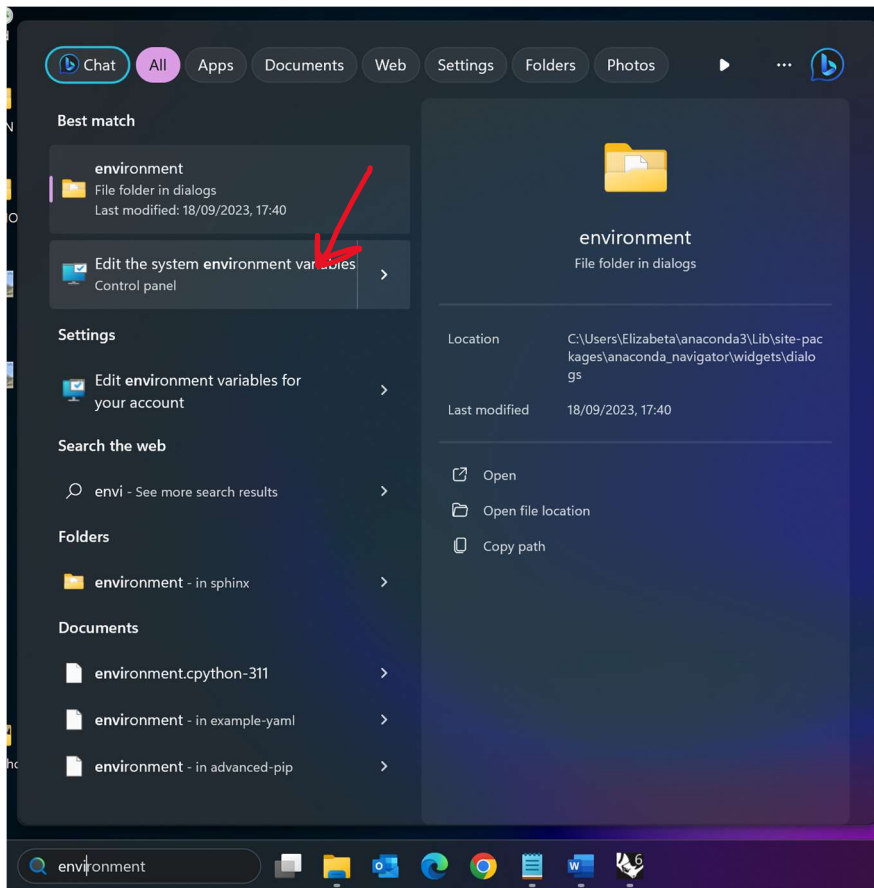
If the installation process was successful, you should get this type of message in your browse.

The screenshot shows the Anaconda website's installation success page. At the top, there are browser tabs for 'Rhino Accounts - Login' and 'Installation Success | Anaconda'. The URL is 'https://www.anaconda.com/installation-success?source=installer'. The navigation bar includes 'ANACONDA.', 'Enterprise', 'Pricing', 'Resources', 'About', and a 'Free Download' button. The main content features a large 'Welcome to Anaconda!' heading, followed by 'Here are some useful resources to help you get started.' Below this is a paragraph about creating a free Anaconda Cloud account. A prominent green button labeled 'Register for Free >' is visible. A large green checkmark icon is on the right. A chat bubble at the bottom right says 'Hey! Welcome to Anaconda here to help. What are you looking for today?'.

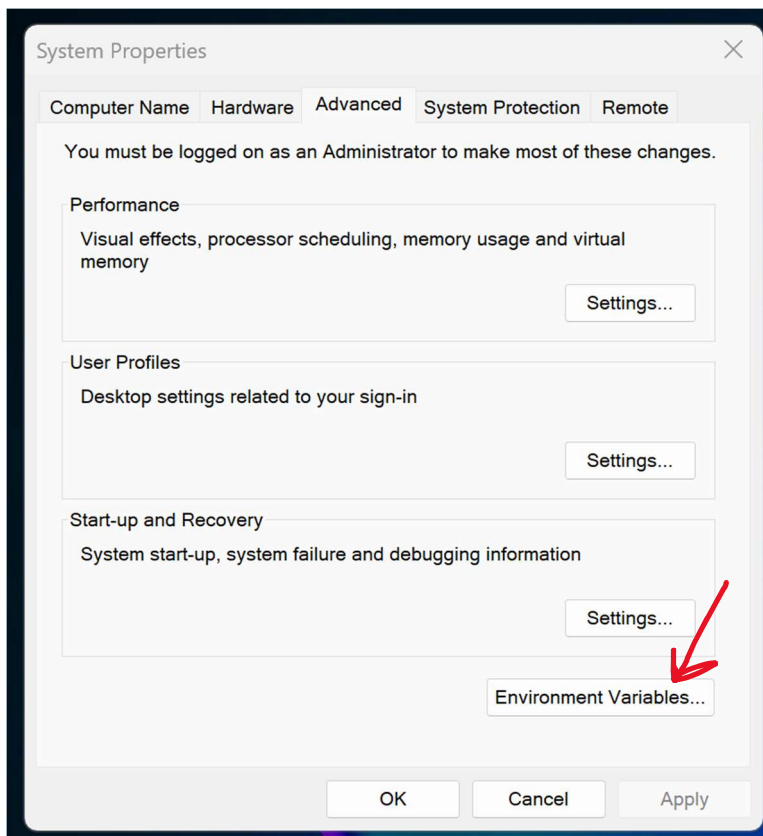
Also, Anaconda navigator will open in new window. You can close it.

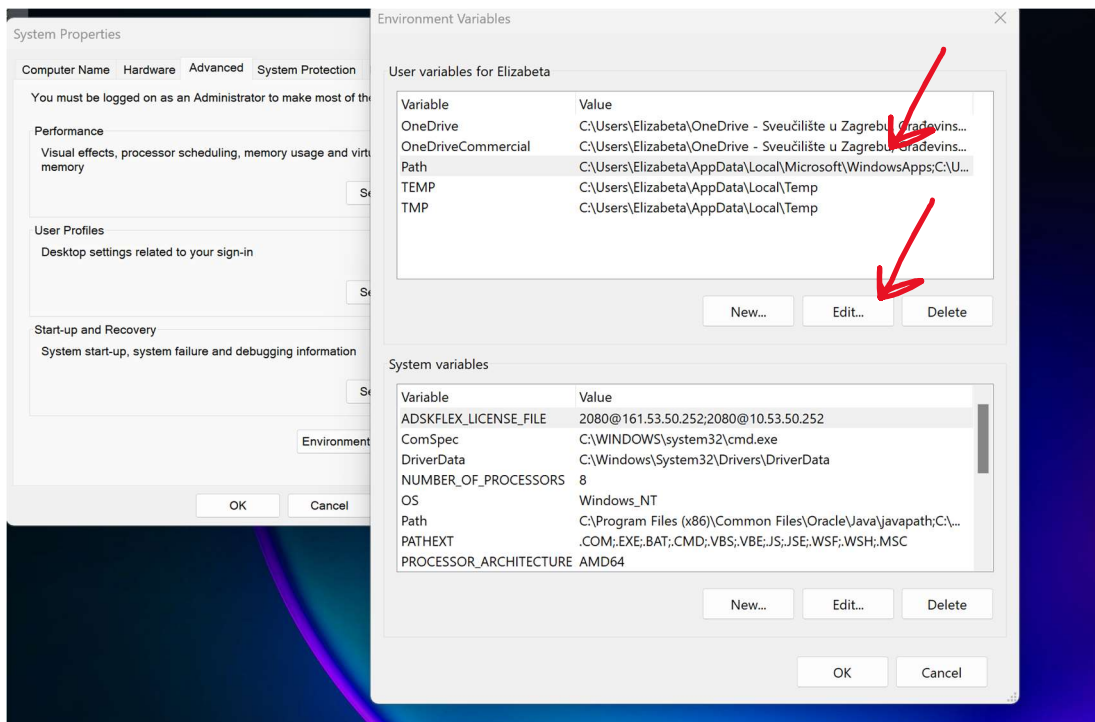
The screenshot displays the Anaconda Navigator application window. The title bar reads 'Anaconda Navigator'. The interface includes a sidebar with 'Home', 'Environments', 'Learning', and 'Community'. The main area is titled 'ANACONDA Data' and features a central 'Sign In Now' button. Surrounding this are several data catalog cards for 'DataSpell', 'rtda', 'pilioty', 'fivethirtyeight', 'penguins', 'uswids', 'volcanoes', 'JupyterLab', and 'Spyder'. Each card provides a brief description and an 'Install' or 'Launch' button. A status bar at the bottom indicates 'Updating package index and metadata...'. A 'Connect' dropdown menu is visible in the top right corner.

After installing Anaconda, make sure you have the paths to anaconda3, Scripts, and Library bin folders on your Path in Environmental Variables. To do so, go to Edit Environmental Variables by typing environmental in your search. Select Edit the system environmental variables.



Click the Environment Variables button. Select PATH and click Edit.





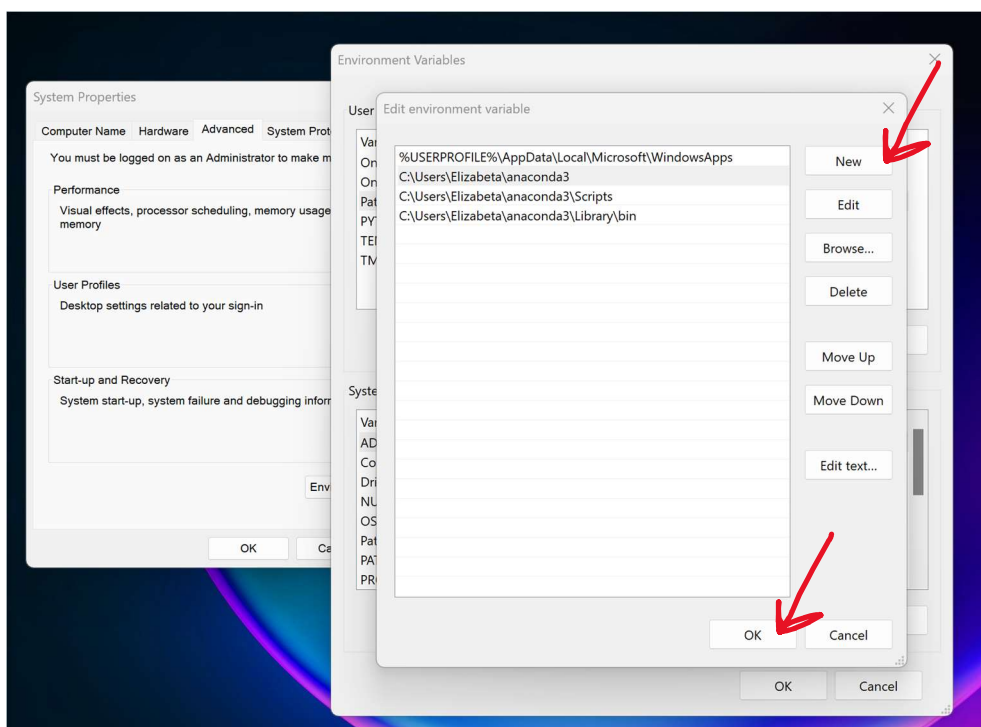
Now enter the path that you saved while installing Anaconda by clicking on the New button. Also add other two paths as listed below (the red part of path differs according to where you have made the installation, the name of the user on your computer is probably not ELIZABETA ☹️):

**C:\Users\Elizabeta\anaconda3**

**C:\Users\Elizabeta\anaconda3\Scripts**

**C:\Users\Elizabeta\anaconda3\Library\bin**

Click OK when you are done.



### 3. step – COMPAS

Now let's install COMPAS. Go to <https://github.com/compas-dev/compas> and on the right side find **Releases** and click on **+ 58 releases** (the number of releases could change in time). For version v1.17.8 click on Source code (.zip) to download COMPAS folder.

main 38 branches 167 tags Go to file Code

gonzalocasas Merge pull request #1202 from compas-dev/bye-cython ... ✓ 0757d64 2 weeks ago 7,096 commits

.github	remove cython requirement	2 weeks ago
docs	remove cython requirement	2 weeks ago
src	Merge pull request #1200 from compas-dev/ellipse-artists	2 weeks ago
tests	Replace planarity with networkx	3 weeks ago
.bumpversion.cfg	Use SemVer2	last month
.editorconfig	update max line length to 120 everywhere	last year
.gitignore	ignore files in temp	last month
.gitpod.yml	remove cython requirement	2 weeks ago
AUTHORS.md	change email	4 months ago
CHANGELOG.md	remove cython requirement	2 weeks ago
CONTRIBUTING.md	Fixed <code>is_point_in_circle_xy</code> second argument to access the origin of...	8 months ago
LICENSE	replace old copyright notice	2 years ago
MANIFEST.in	update max line length to 120 everywhere	last year
README.md	fix links to 1.17.5 docs	last month
confest.py	update tests and config	last year
pyproject.toml	don't include doctests	last year
requirements-dev.txt	Merge branch 'main' into extendible_artist	3 months ago
requirements.txt	remove cython requirement	2 weeks ago
setup.cfg	Switch to use <code>compas_invocations</code> for <code>tasks.py</code>	last year
setup.py	Replace planarity with networkx	3 weeks ago
tasks.py	Switch to use <code>compas_invocations</code> for <code>tasks.py</code>	last year

About  
Core packages of the COMPAS framework.  
[compas.dev/compas/](#)  
topology datastructures blender  
geometry rhino robots grasshopper  
solvers aec  
Readme  
MIT license  
Code of conduct  
Activity  
270 stars  
23 watching  
90 forks  
Report repository

Releases 59  
v1.17.8 Latest 3 weeks ago  
[+ 58 releases](#)

Contributors 43  
[+ 32 contributors](#)

3 weeks ago  
github-actions  
v1.17.8  
0107e8a  
Compare

**v1.17.8** Latest

Added

Changed

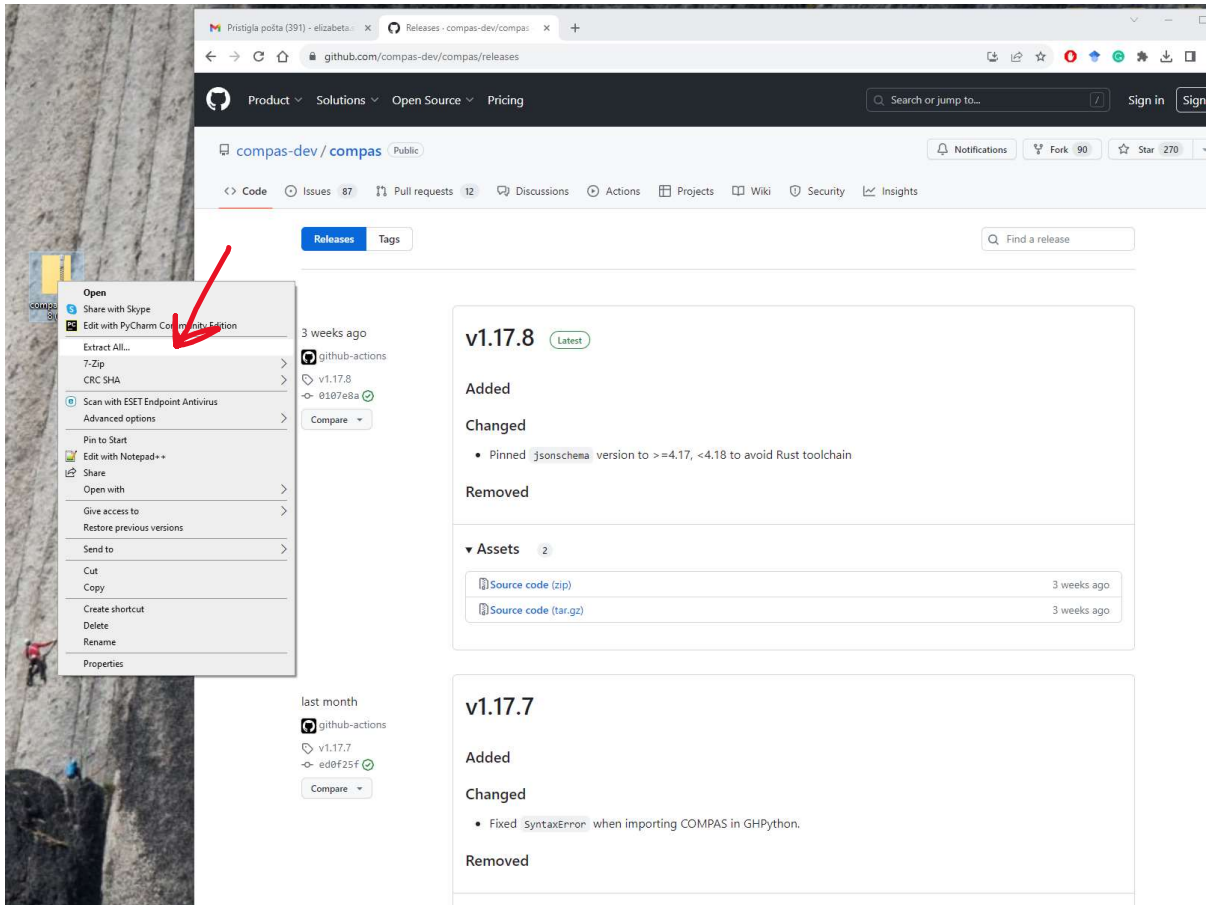
- Pinned `jsonschema` version to `>=4.17, <4.18` to avoid Rust toolchain


Removed

▼ Assets 2

- [Source code \(zip\)](#) 3 weeks ago
- [Source code \(tar.gz\)](#) 3 weeks ago

Put the folder from downloads to Desktop and unzip it (right click then Extract All)



←  Extract Compressed (Zipped) Folders

### Select a Destination and Extract Files

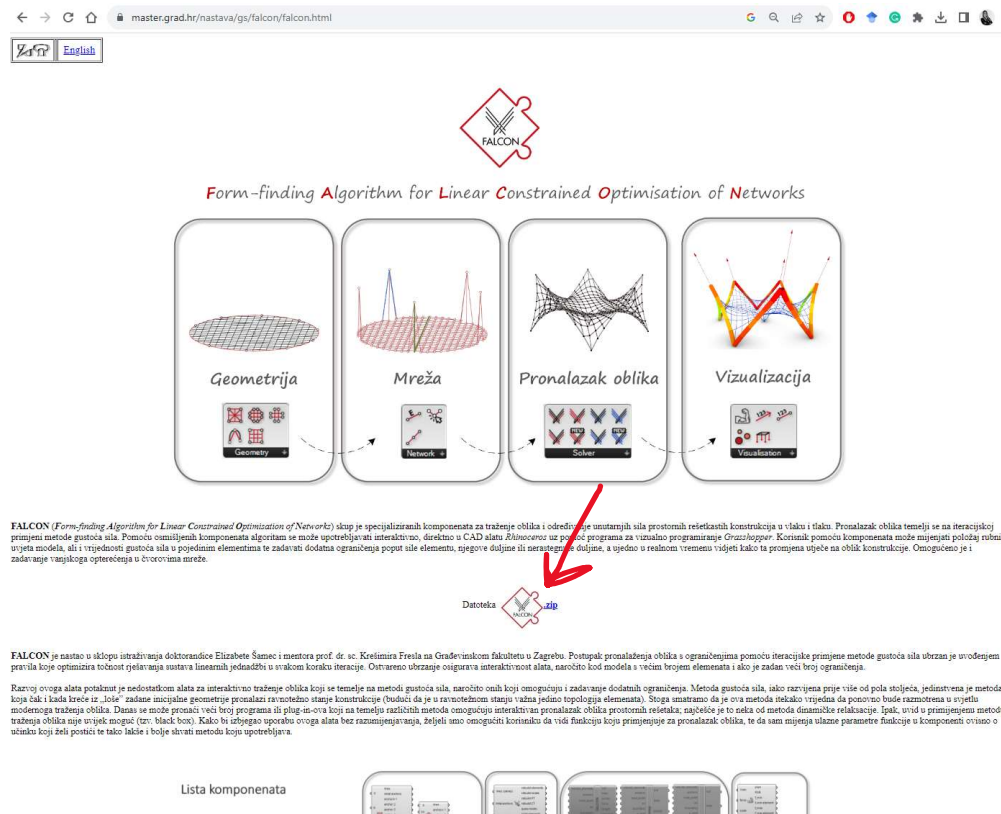
Files will be extracted to this folder:

Show extracted files when complete



## 4. step – FALCON

Go to <https://master.grad.hr/nastava/gf/falcon/falcon.html> and download FALCON zip folder. Put the folder from downloads to Desktop and unzip the folder.



The screenshot shows the FALCON website interface. At the top, there is a logo and the title "Form-finding Algorithm for Linear Constrained Optimisation of Networks". Below this, a horizontal flowchart illustrates the process in four stages: "Geometrija" (Geometry), "Mreža" (Network), "Pronalazak oblika" (Shape Finding), and "Vizualizacija" (Visualization). Each stage is represented by a 3D model and a set of icons. A red arrow points from the "Pronalazak oblika" stage down to a download link labeled "Datoteka" with a ".zip" extension.

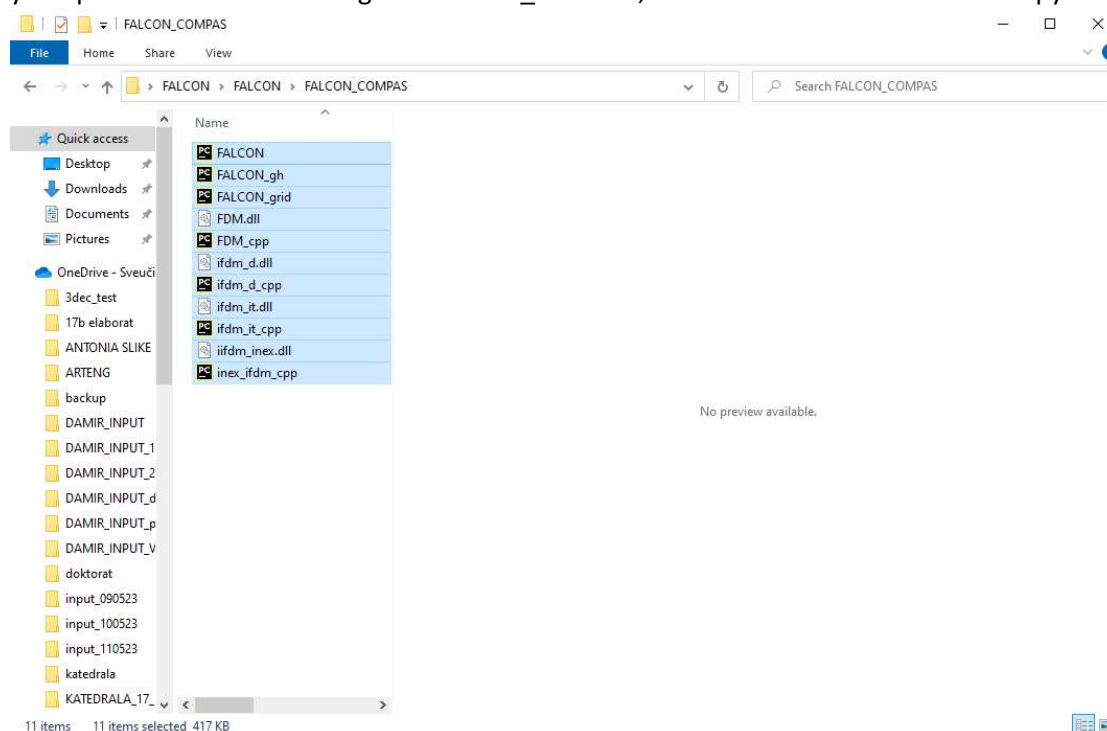
**FALCON** (Form-finding Algorithm for Linear Constrained Optimisation of Networks) skup je specijaliziranih komponenti za traženje oblika i određivanje unutarnjih sila prostornih rešetkastih konstrukcija u vlaknu i tlaku. Pronalazak oblika temelji se na iteracijskoj primjeni metode gustoća sila. Posebno osmišljenim komponentama algoritam se može upotrebljavati interaktivno, direktno u CAD alatu *Rhinoceros* uz pomoć programa za vizualno programiranje *Grasshopper*. Korisnik pomoću komponenti može mijenjati položaj rubnih uvjeta modela, ali i vrijednosti gustoća sila u pojedinih elementima te zadavati dodatna ograničenja poput sile elementa, njegove duljine ili naraštajnog slobodnog, a ujedno u realnom vremenu vidjeti kako ta promjena utječe na oblik konstrukcije. Omogućeno je i zadavanje vanjskoga opterećenja u čvorovima mreže.

**FALCON** je nastao u sklopu istraživanja doktorandice Elizabete Šamec i mentora prof. dr. sc. Krešimira Frelja na Građevinskom fakultetu u Zagrebu. Postupak pronalaska oblika s ograničenjima pomoću iteracijske primjene metode gustoća sila ubrzan je uvođenjem pravila koje optimizira točnost rješavanja sustava linearnih jednadžbi u svakom koraku iteracije. Ostvareno ubrzanje osigurava interaktivnost alata, naročito kod modela s većim brojem elemenata i ako je zadani veći broj ograničenja.

Razvoj ovoga alata potaknut je nedostatkom alata za interaktivno traženje oblika koji se temelje na metodi gustoća sila, naročito onih koji omogućuju i zadavanje dodatnih ograničenja. Metoda gustoća sila, iako razvijena prije više od pola stoljeća, jedinstvena je metoda koja čak i kada kreće iz "loše" zadane inicijalne geometrije pronalazi ravnotežno stanje konstrukcije (budući da je u ravnotežnom stanju važna jedino topologija elementa). Stoga smatramo da je ova metoda itekako vrijedna da ponovno bude razmatrana u svjetlu modernoga traženja oblika. Dva su se mode pronalazi oblika: prvi je u ovom programu ili plug-in-u ova koji se temelje različitim metodama omogućujući interaktivno pronalazak oblika prostornih rešetkastih, najčešće je to oblik od metoda dinamičke relaksacije. Ipak, uvid u primjenjenu metodu traženja oblika nije uvijek moguć (tzv. black-box). Kako bi ubrzao uporabu ovoga alata bez razumijevanja, željeli smo omogućiti korisniku da vidi funkciju koju primjenjuje za pronalazak oblika, te da sam mijenja ulazne parametre funkcije u komponenti ovisno o obliku koji želi postići te tako lakše i bolje shvati metodu koju upotrebljava.

Lista komponenta

On Desktop, you should now have **compas-1.17.8** folder and **FALCON** folder (both unzipped). Then you open **FALCON** folder and go to **FALCON\_COMPAS**, select all the files and make a copy.

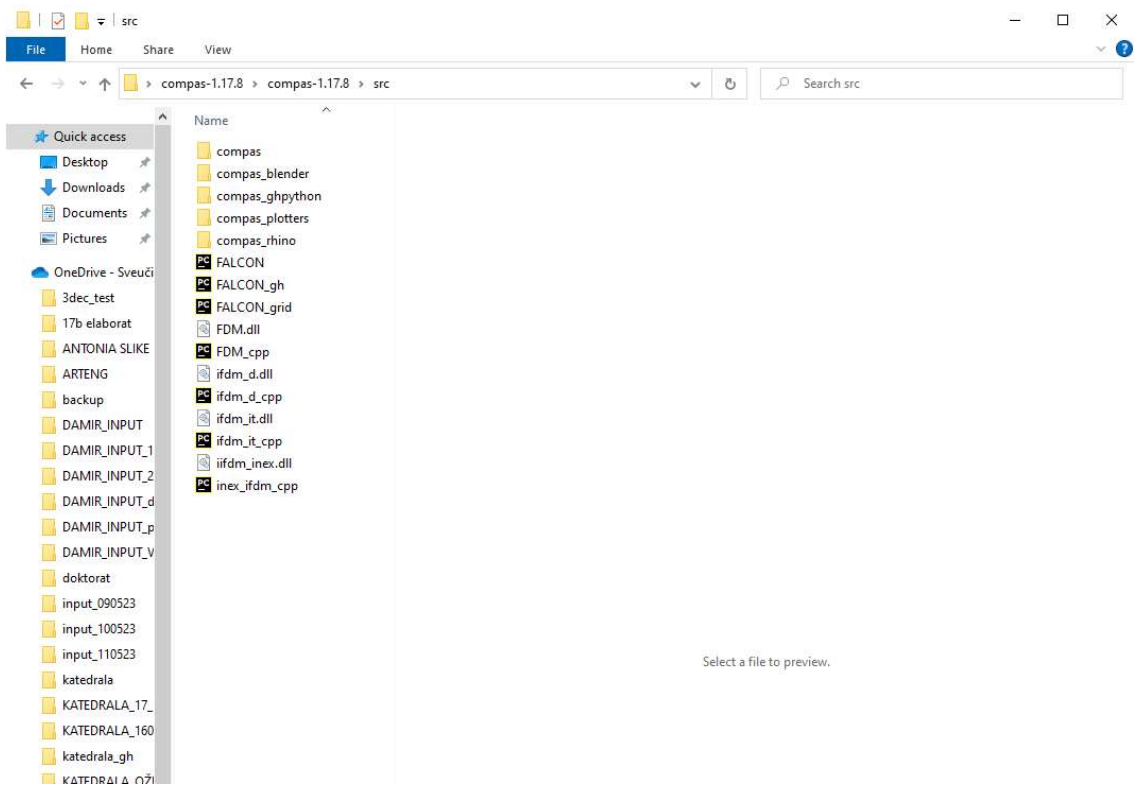


The screenshot shows a Windows File Explorer window with the path "FALCON > FALCON > FALCON\_COMPAS". The file list contains the following items:

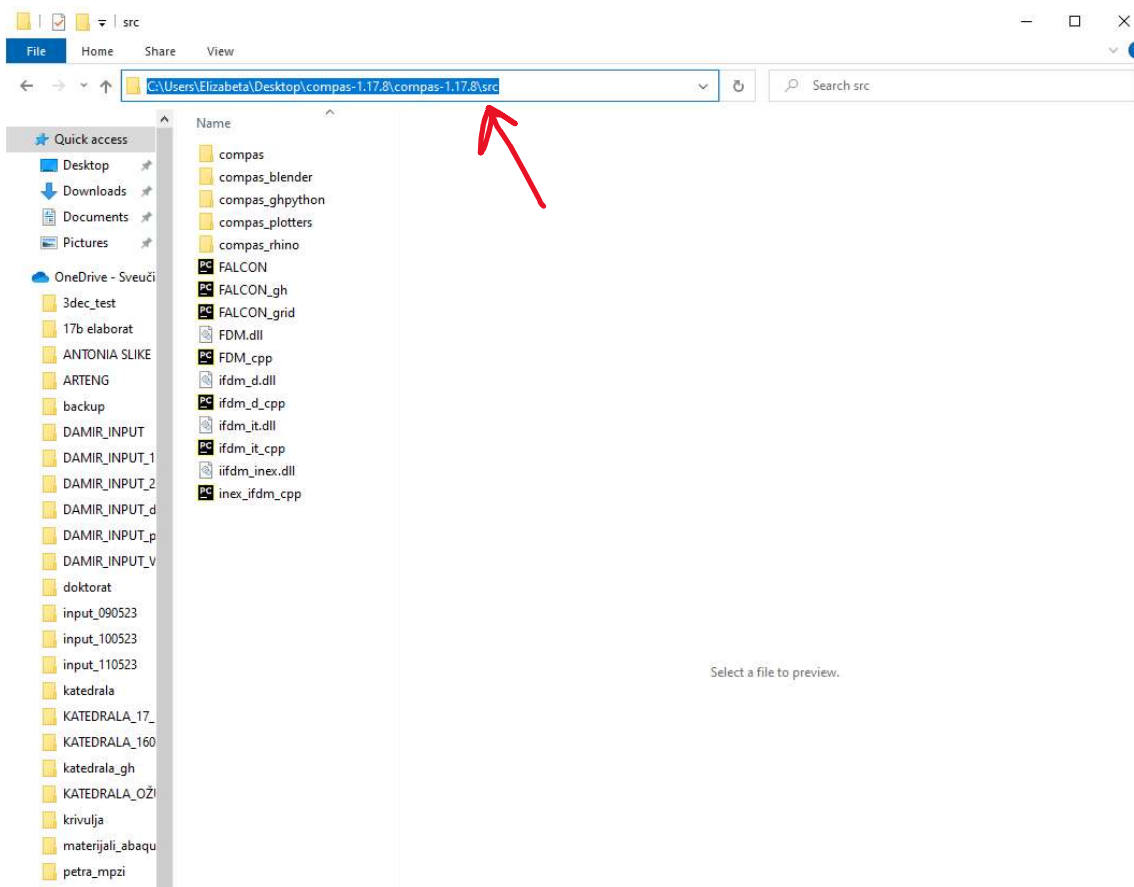
- FALCON
- FALCON\_gh
- FALCON\_grid
- FDM.dll
- FDM\_cpp
- ifdm\_d.dll
- ifdm\_d\_cpp
- ifdm\_it.dll
- ifdm\_it\_cpp
- iifdm\_inex.dll
- inex\_ifdm\_cpp

At the bottom of the window, it indicates "11 items 11 items selected 417 KB".

Paste selected files in to src folder of compas-1.17.8 folder.

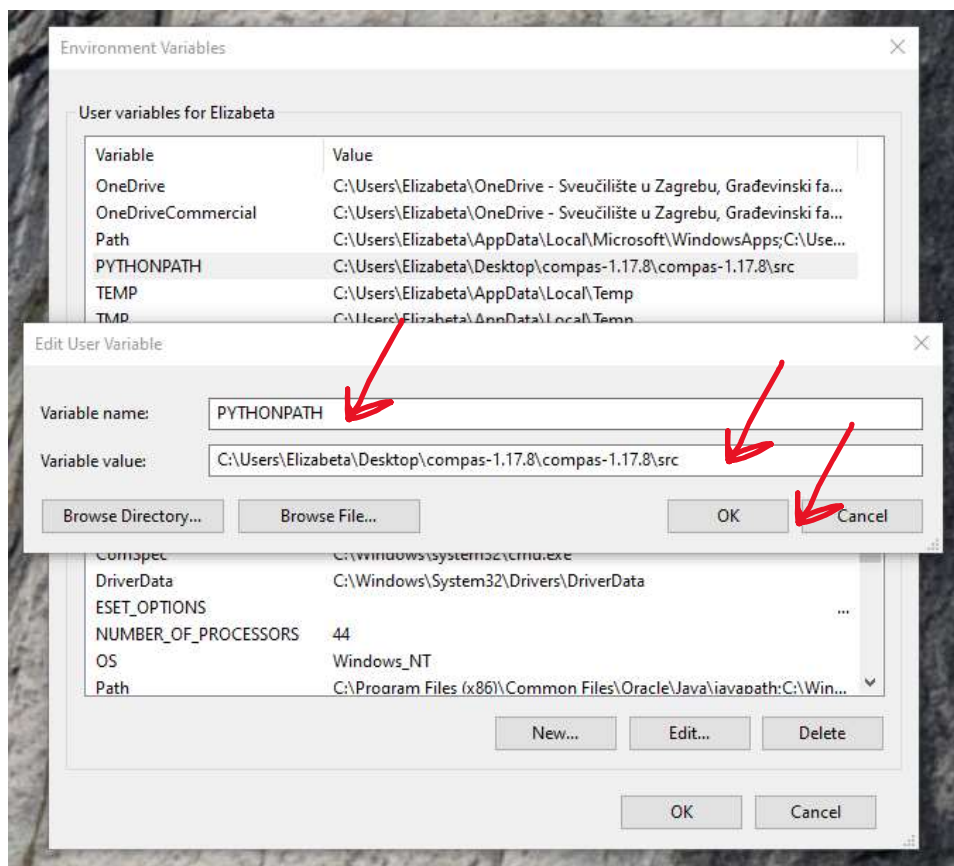
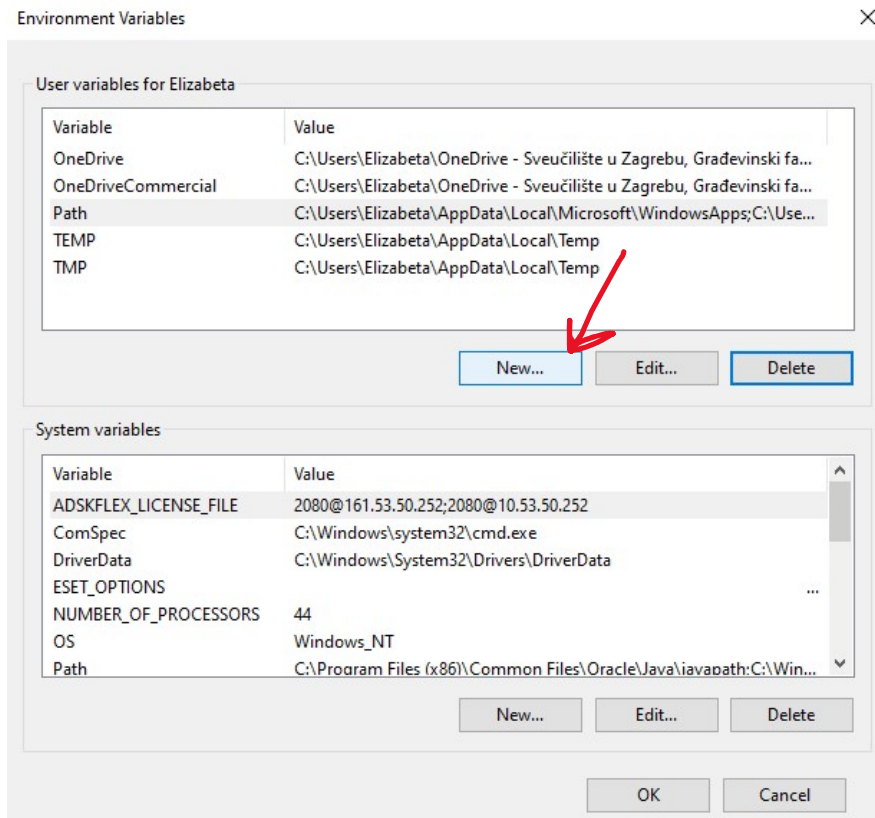


Now make a copy of the path to that folder.

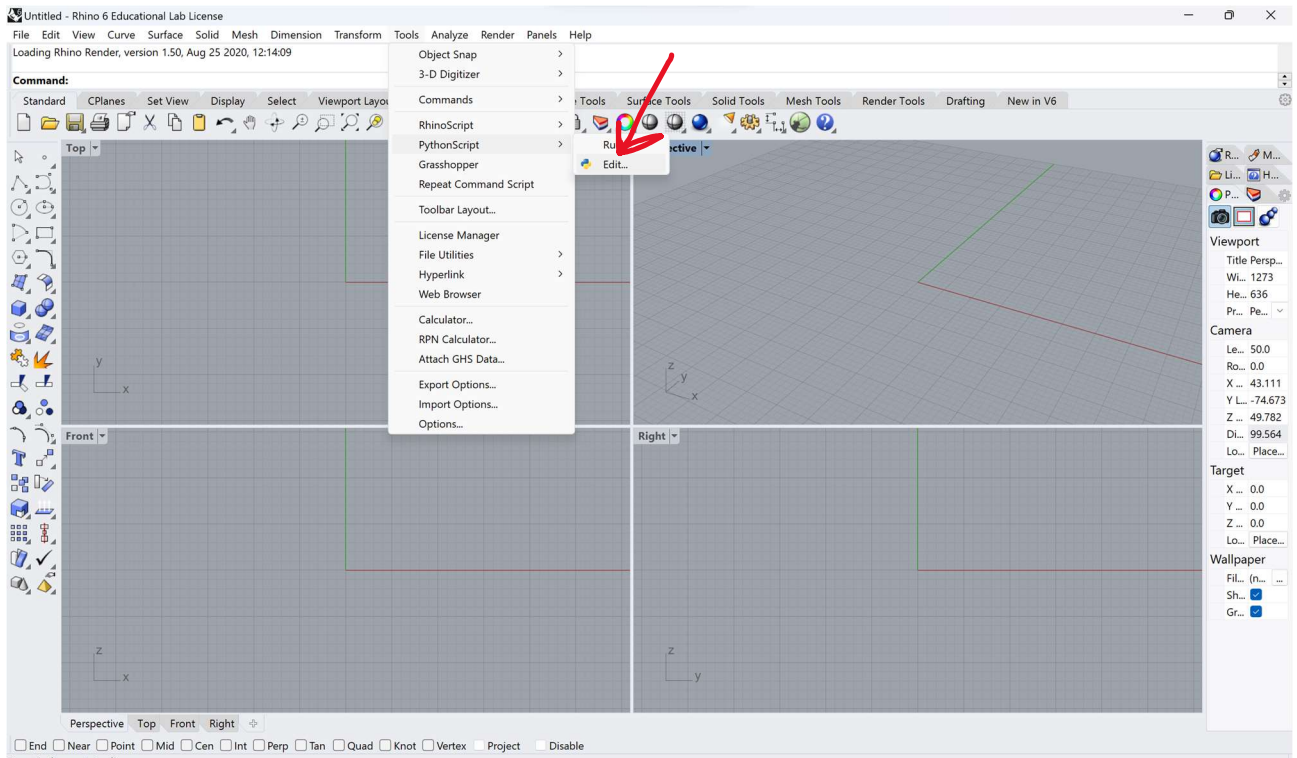




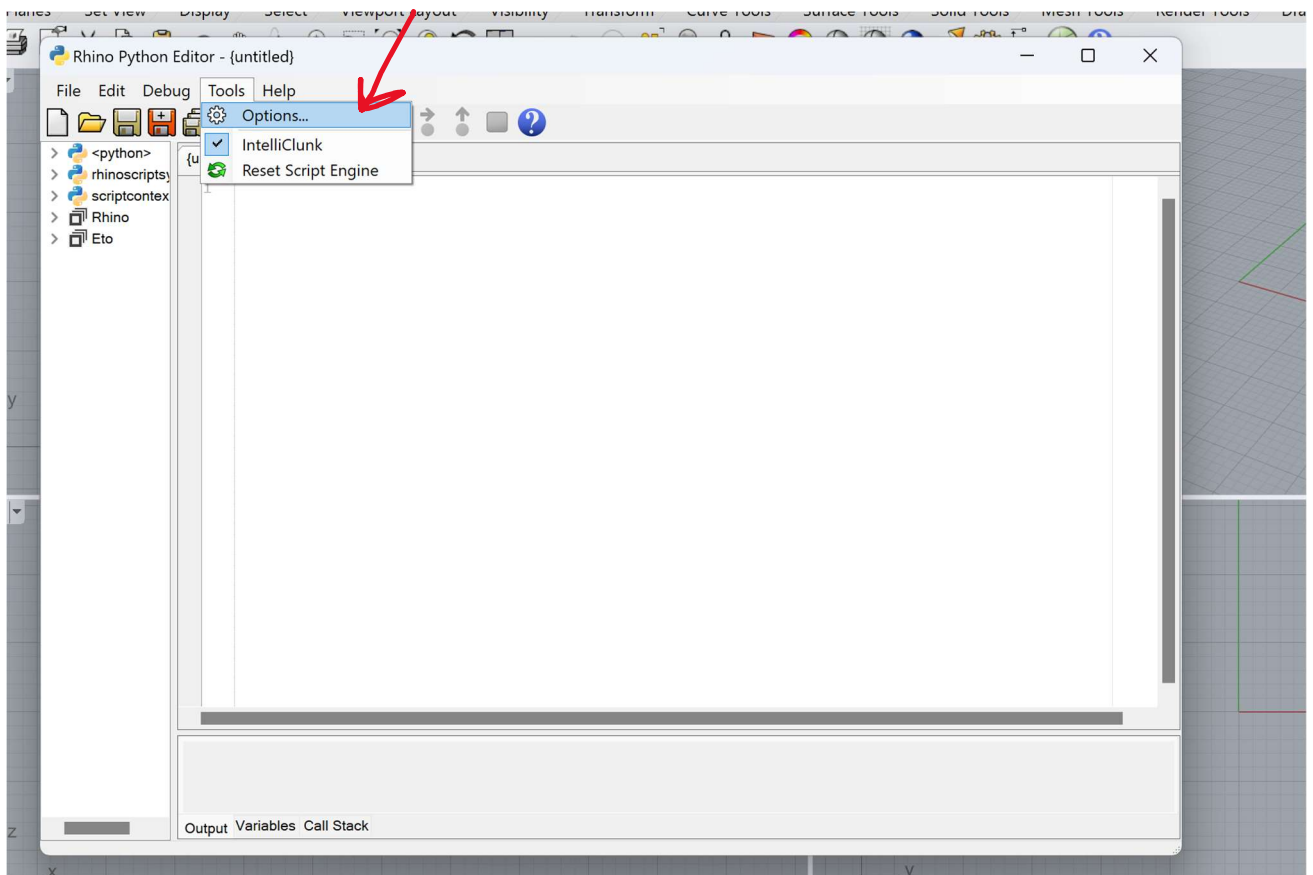
Now go back to Environmental variables and create a new path. Name it PYTHONPATH and paste the path to src folder that you have copied.



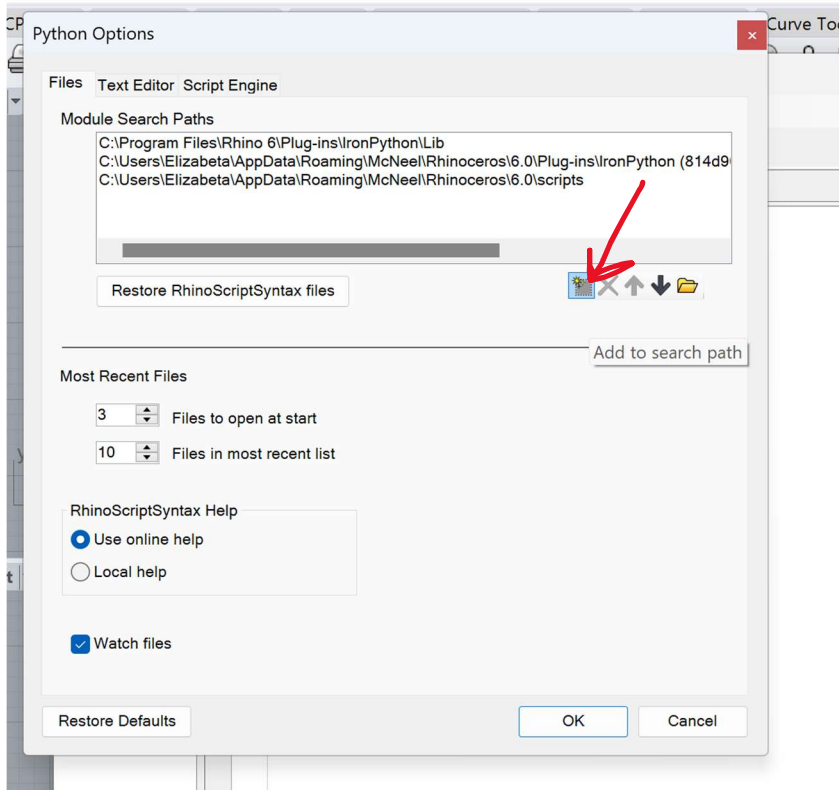
Put the same path in Rhino 6. Click Tools and select PythonScript and Edit.



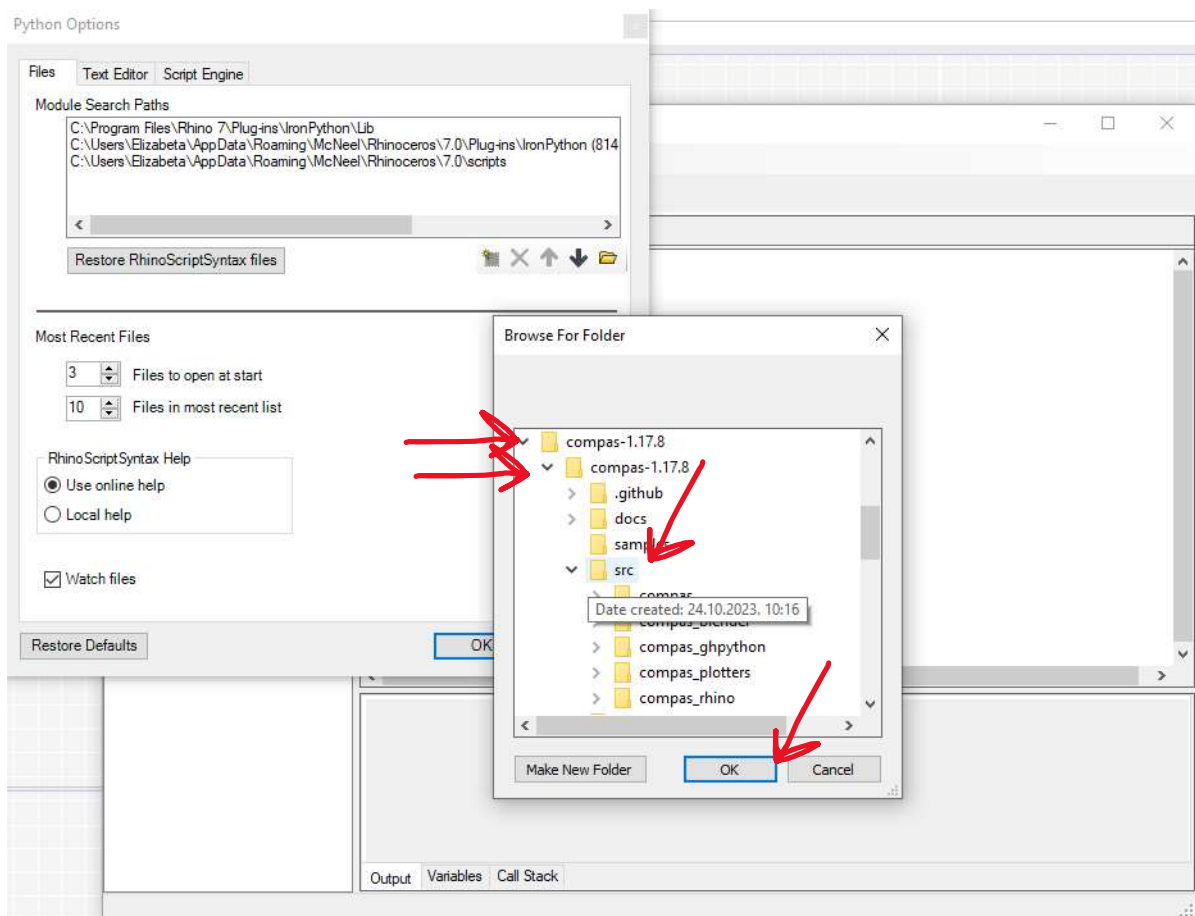
Again select Tools and Options

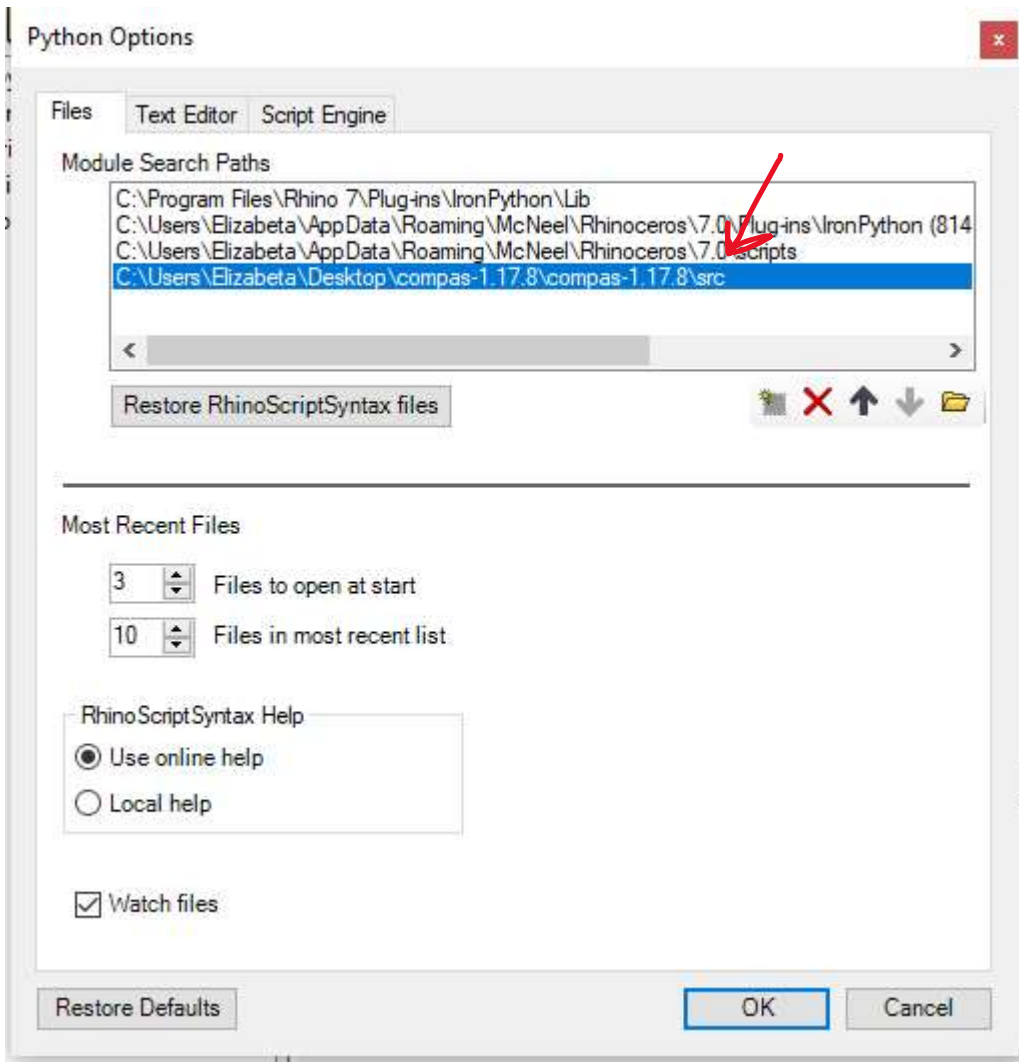


Add path by clicking on the icon shown on the picture below.



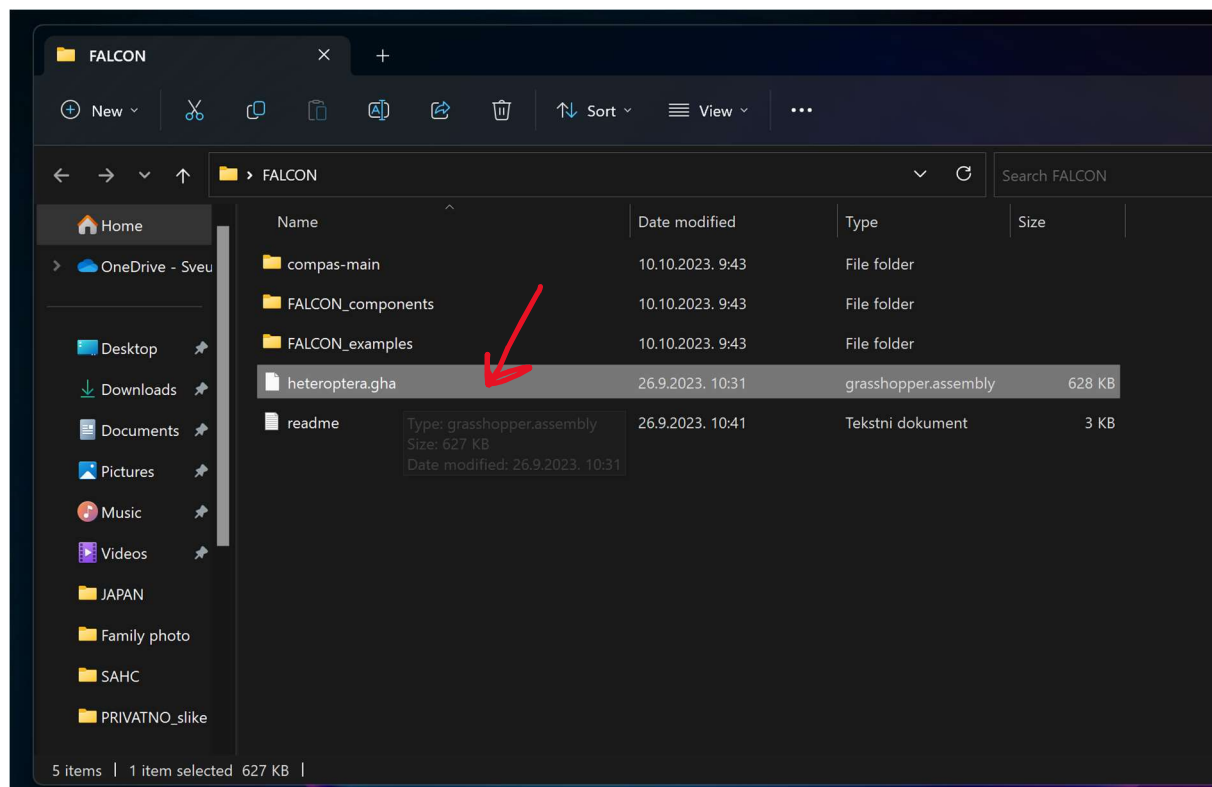
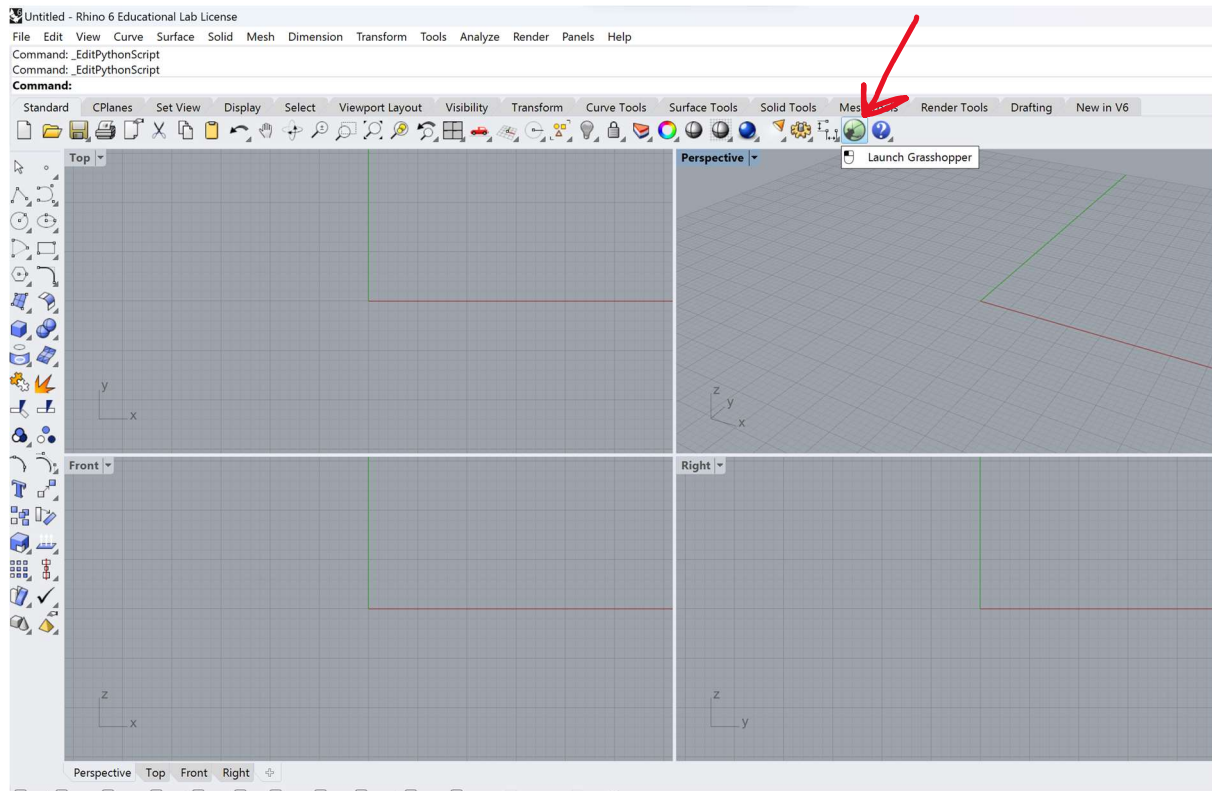
This will open a window to browse for the **src** folder. Click the arrow on the left side of the **compas** folder to get to the **src** folder. Then click **OK** and new path should appear. Close all windows.

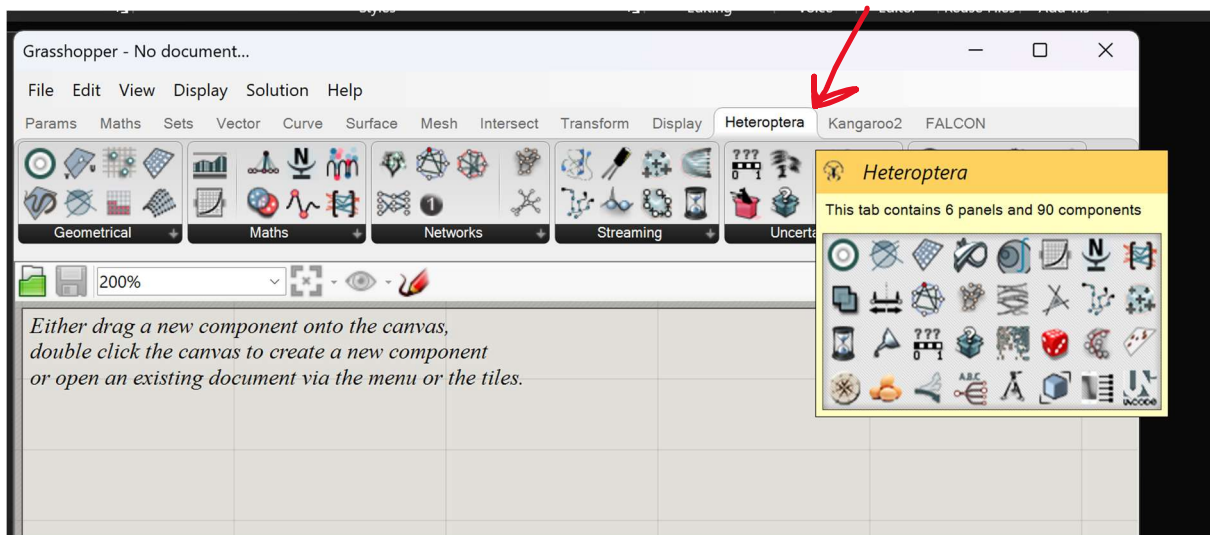
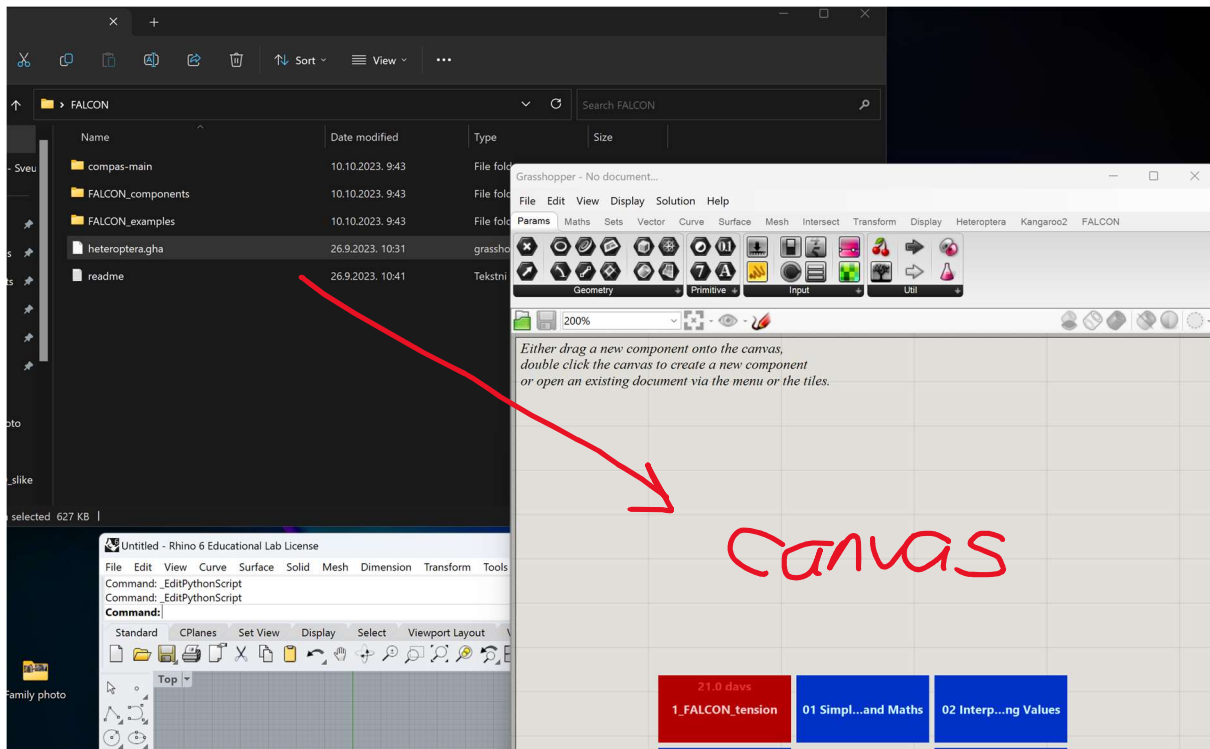




## 5. step – Heteroptera

Component Interactive net contains L-net and R-net components from Heteroptera plug-in. Open Grasshopper by clicking on the icon at the toolbar. Take heteropteran.gha file from FALCON folder and just drag it to Grasshopper canvas.

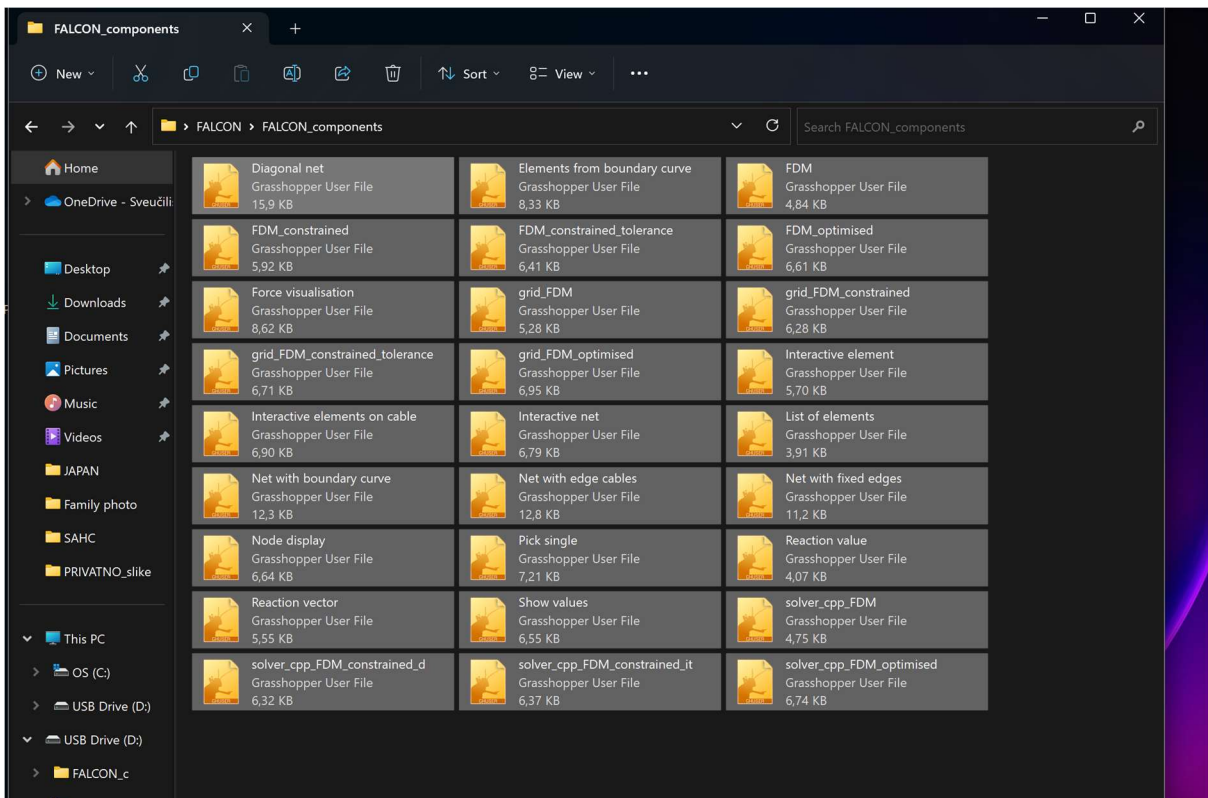
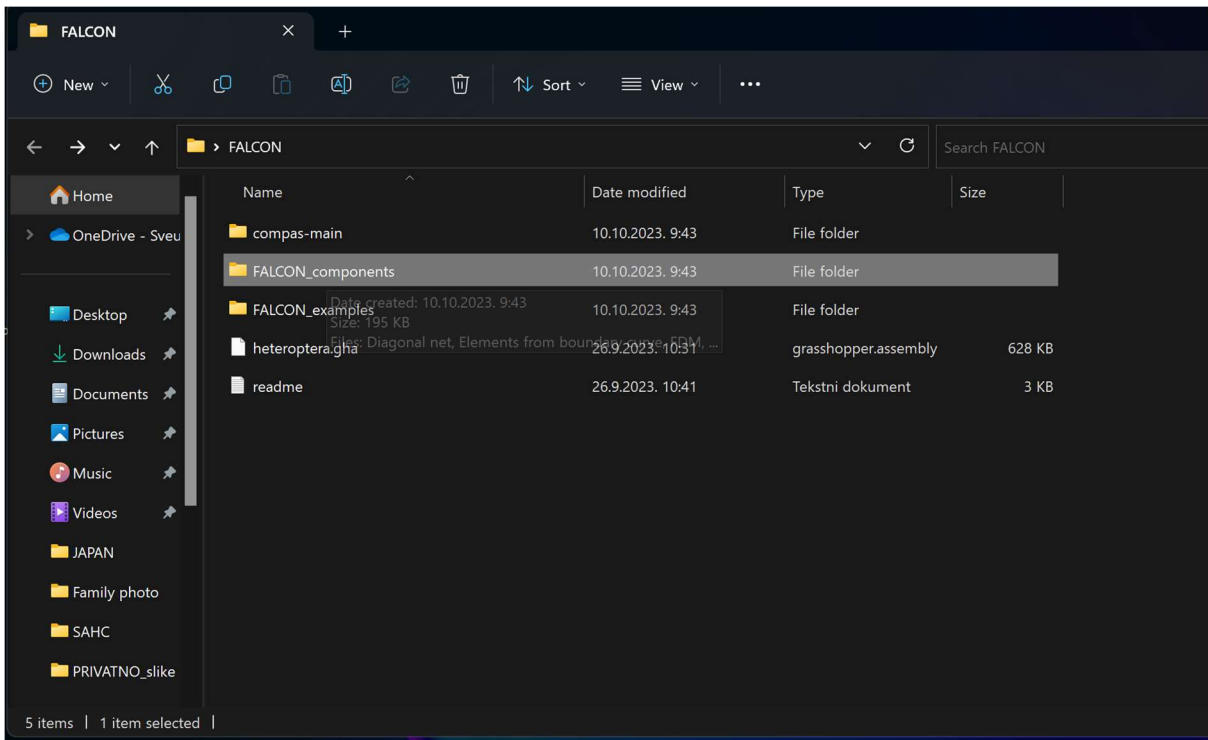




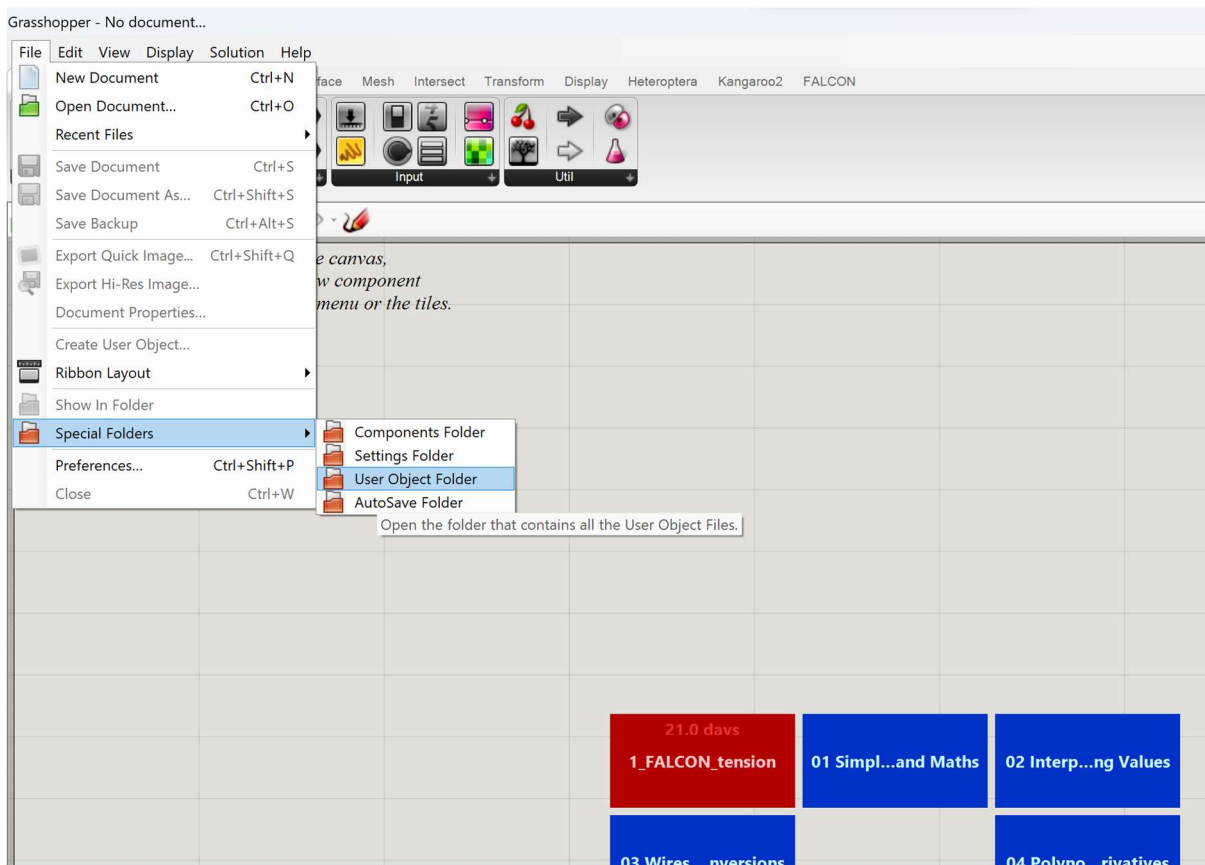
New set of components will appear under Heteroptera card at the toolbar in Grasshopper.

## 6. step – FALCON components in Rhino

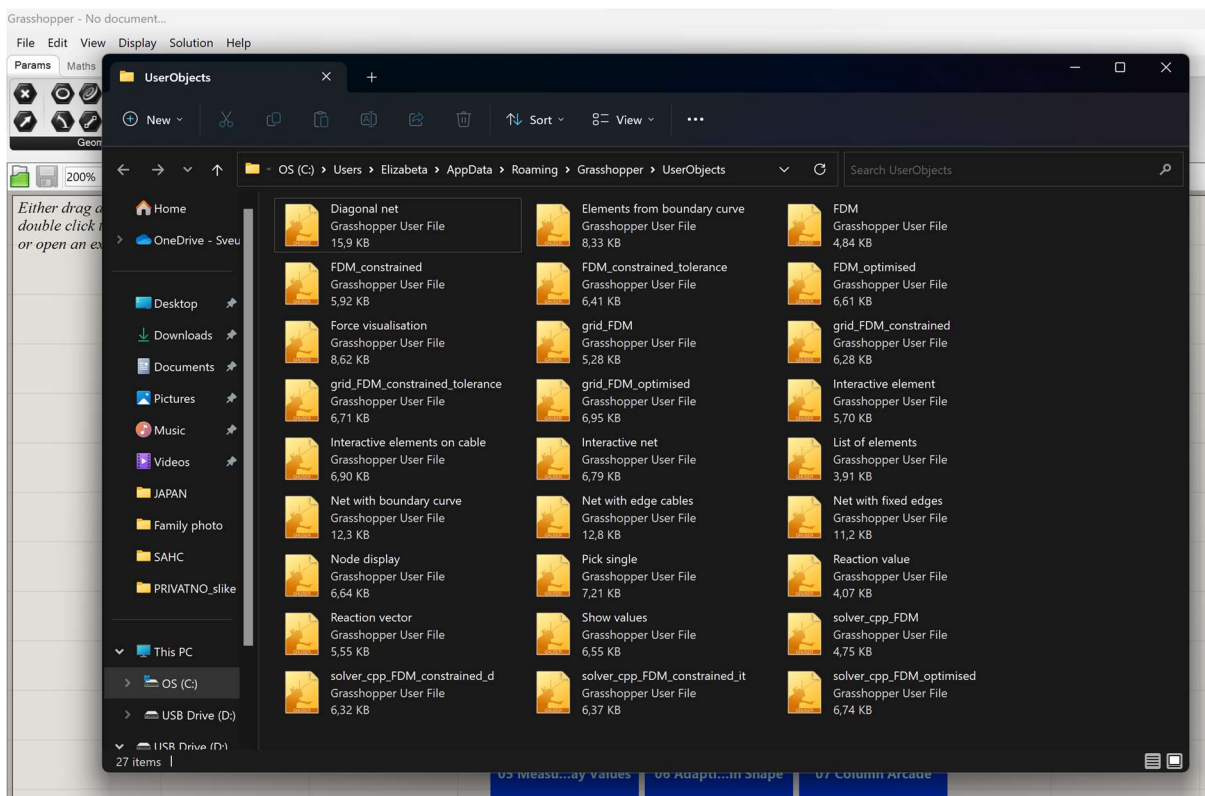
Open FALCON\_components folder and select and copy all files in it.



Then inside Grasshopper open File, Special Folders and select User Object Folder.

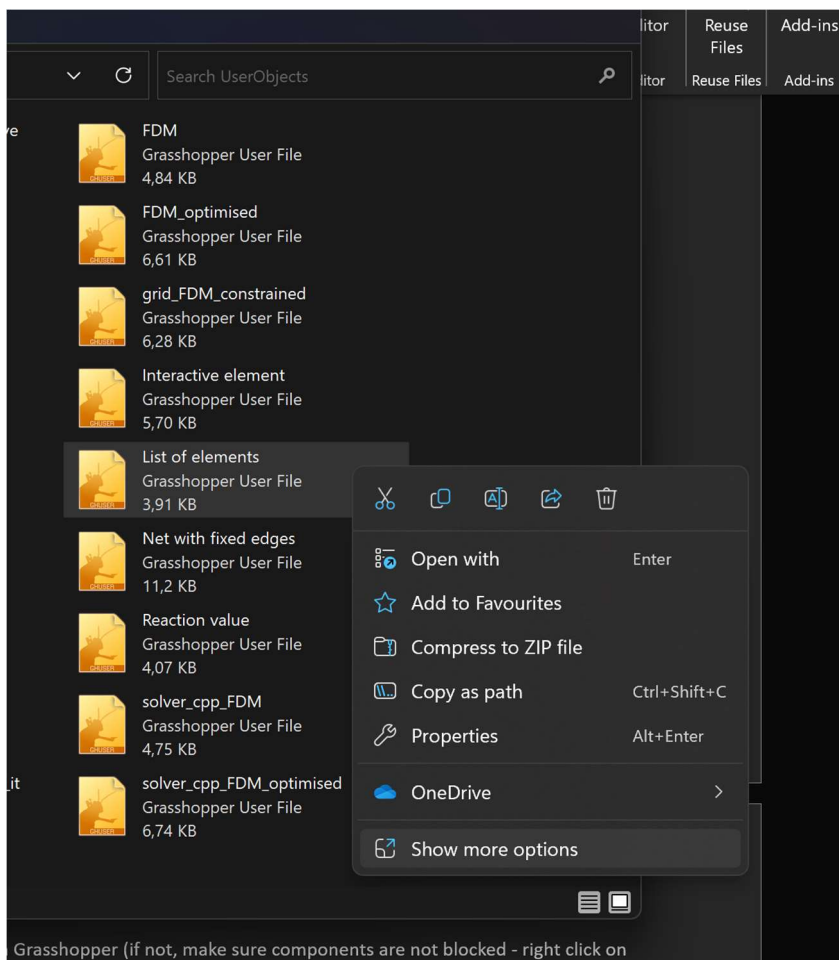
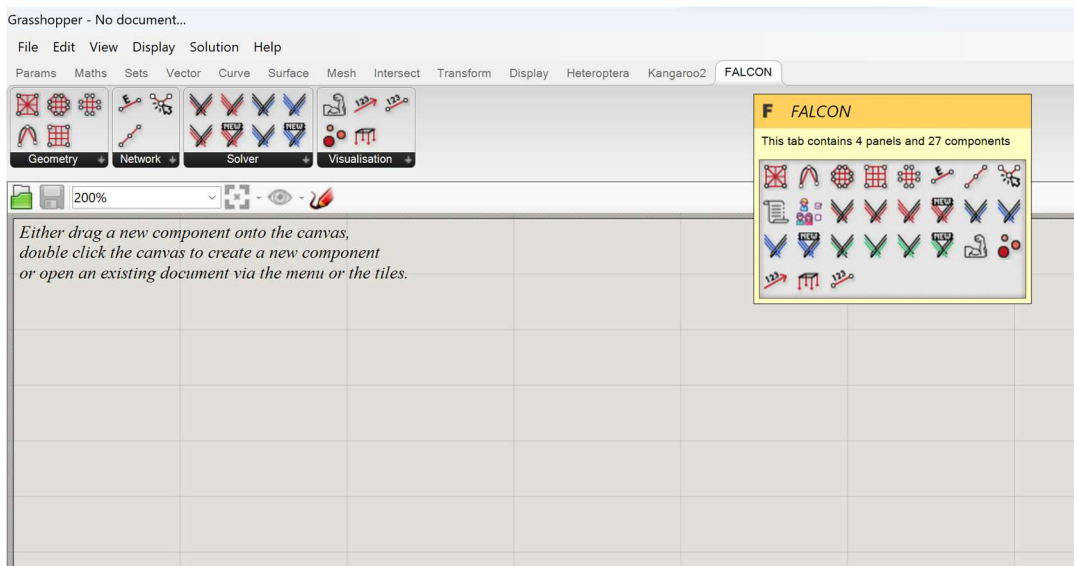


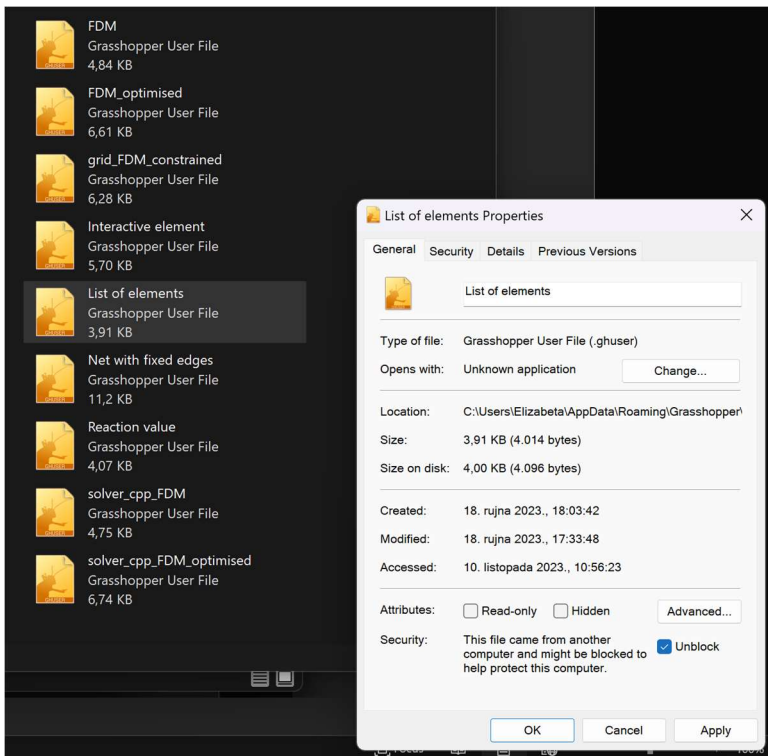
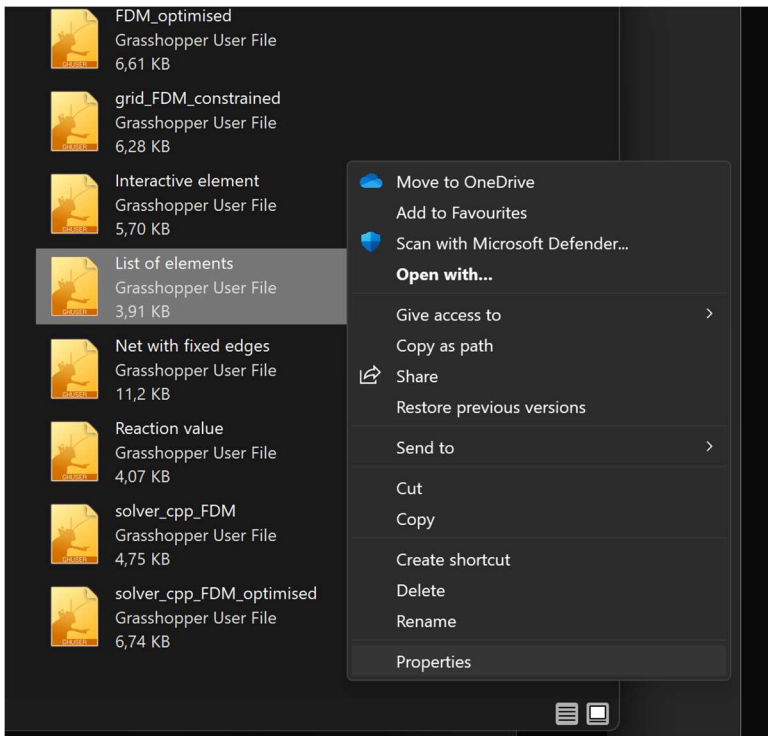
Past all the file from





FALCON tab will appear in Grasshopper (if not, make sure components are not blocked - right click on the component -> Show more options -> Properties -> Unblock).





...and that's it...**don't forget to restart Rhino before starting to work and enjoy using it :)**