User guide for Numerikiando

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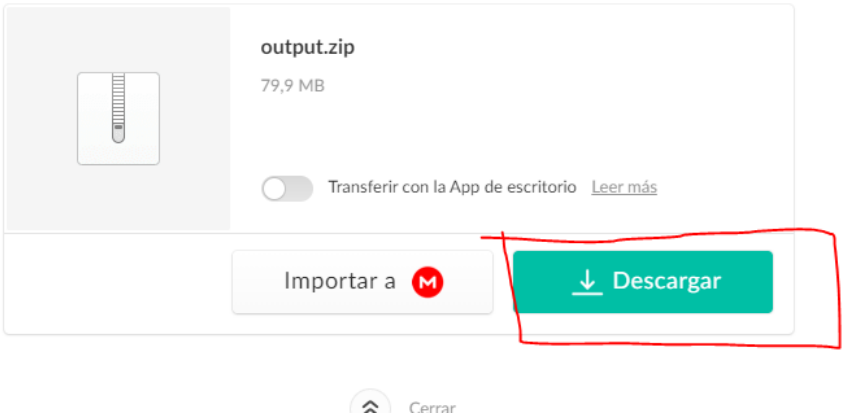
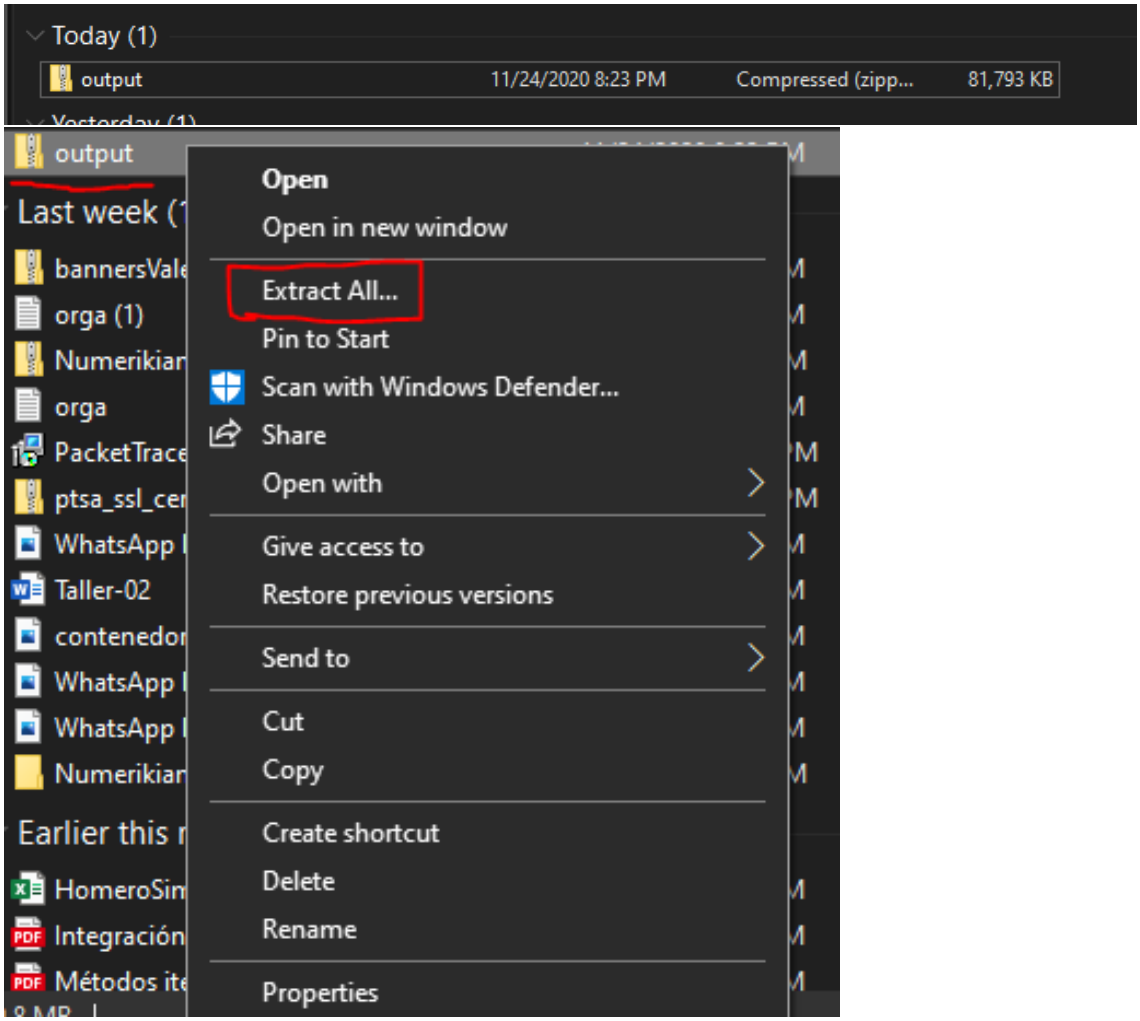
Steps to install Numerikiando:

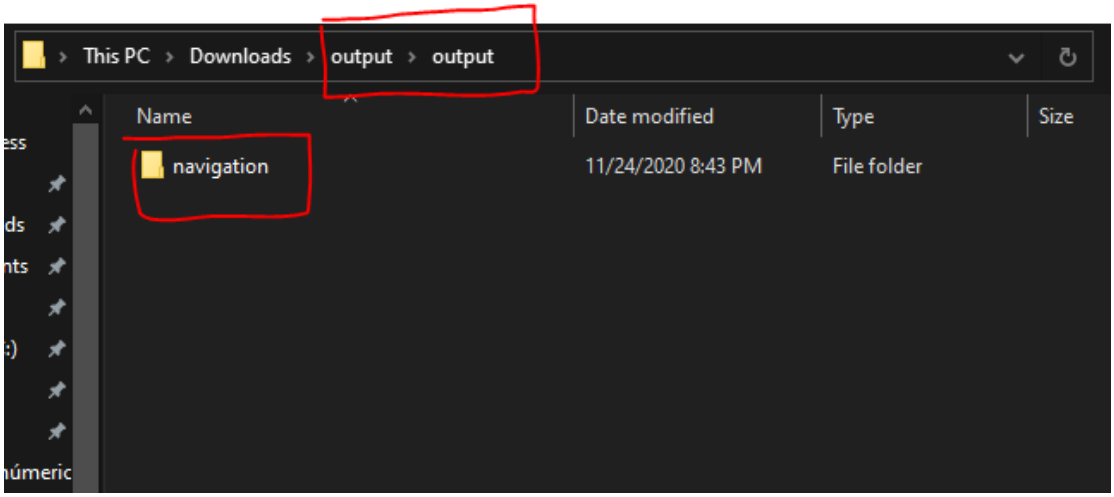
1. You have to download the .zip in Mega



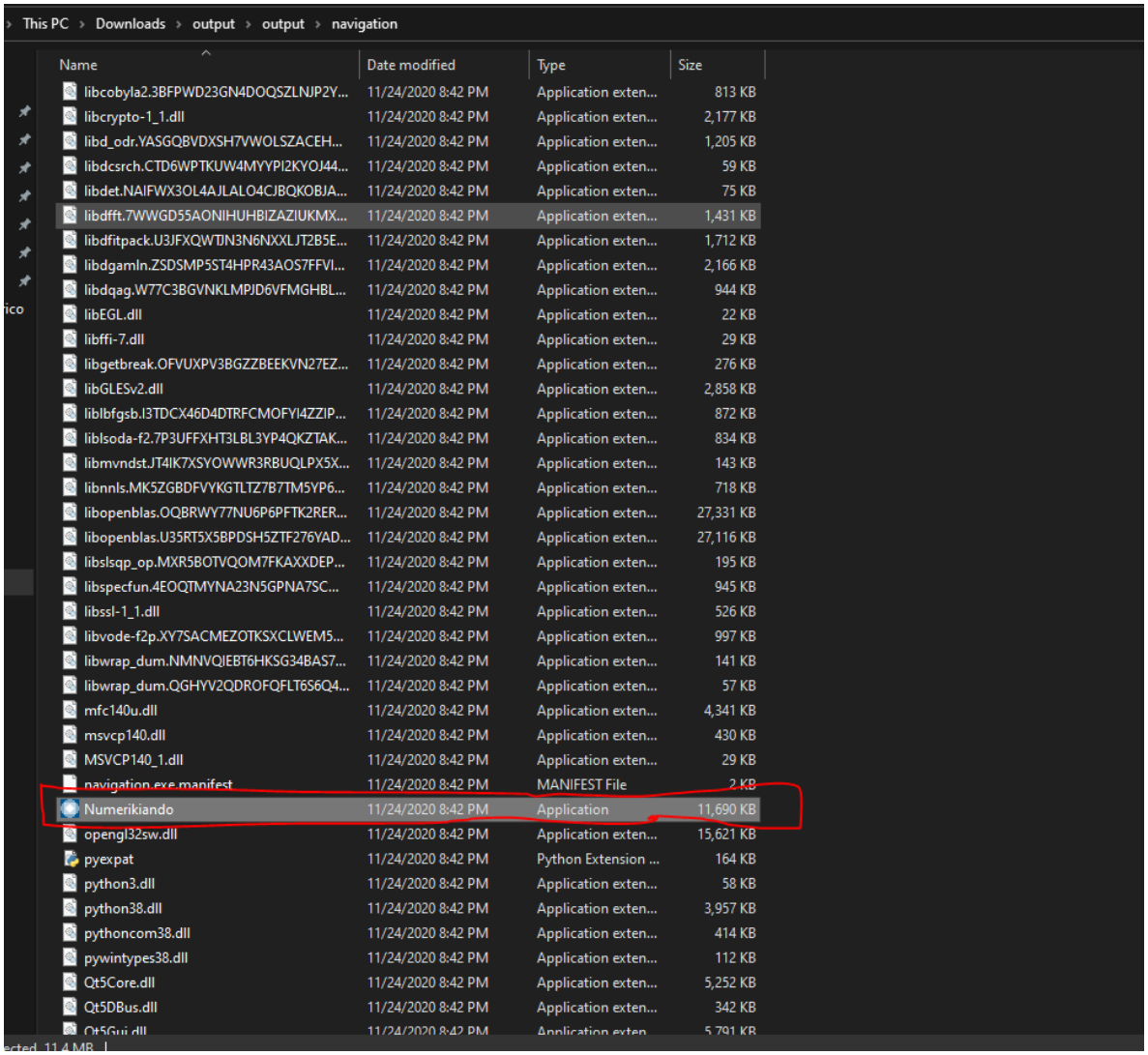
2. Then you must right click on the .zip file and click Extract All



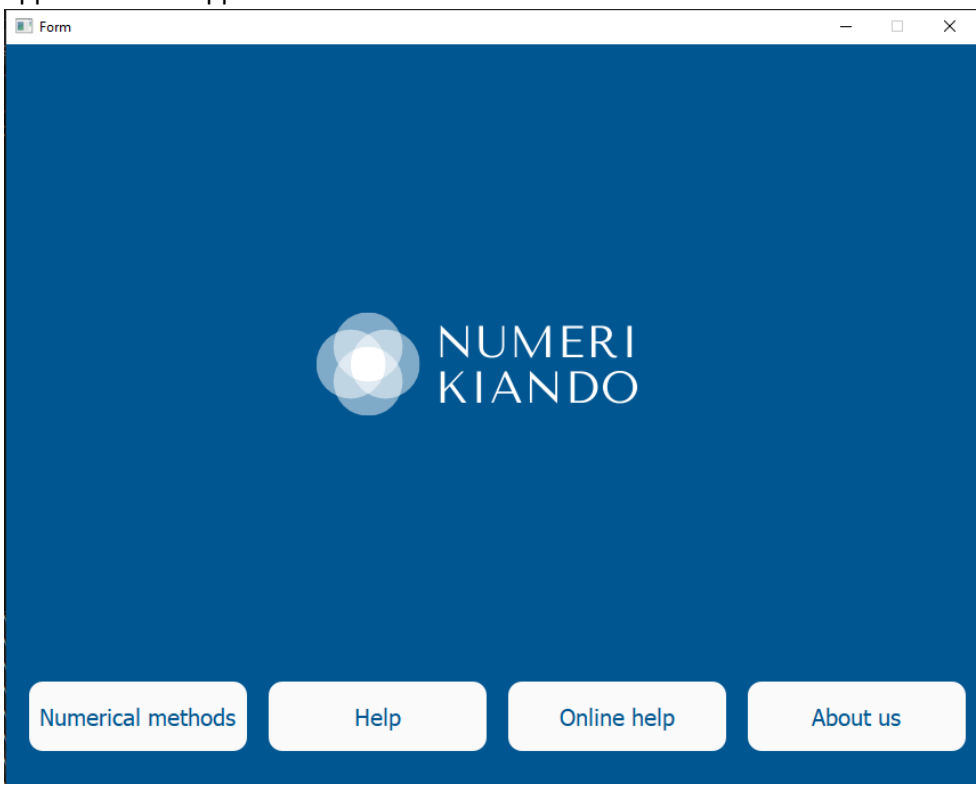
3. Then you have to go into the folder and into navigation folder



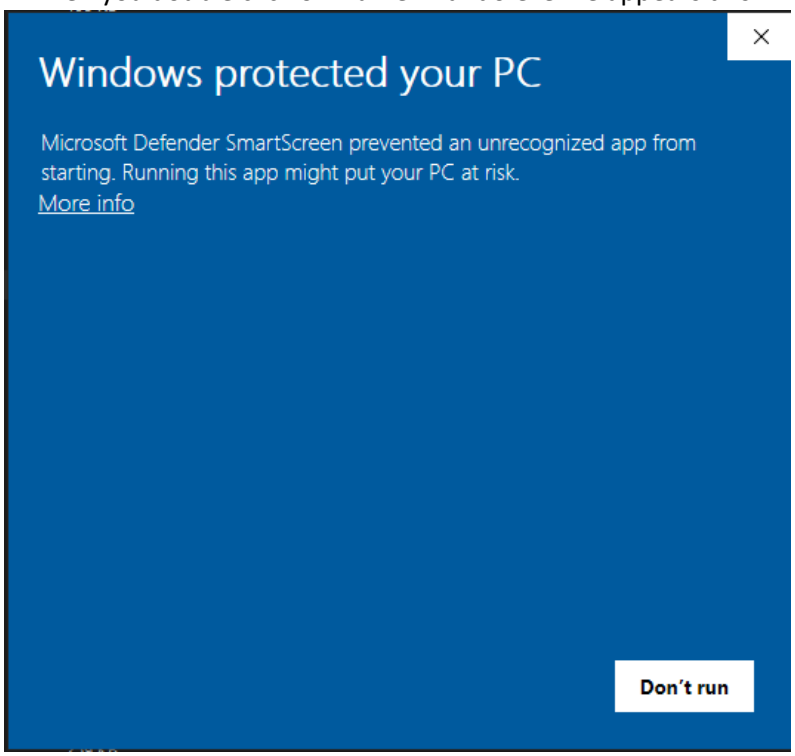
4. When you are inside navigation folder, you have to look for Numerikiando.exe file.



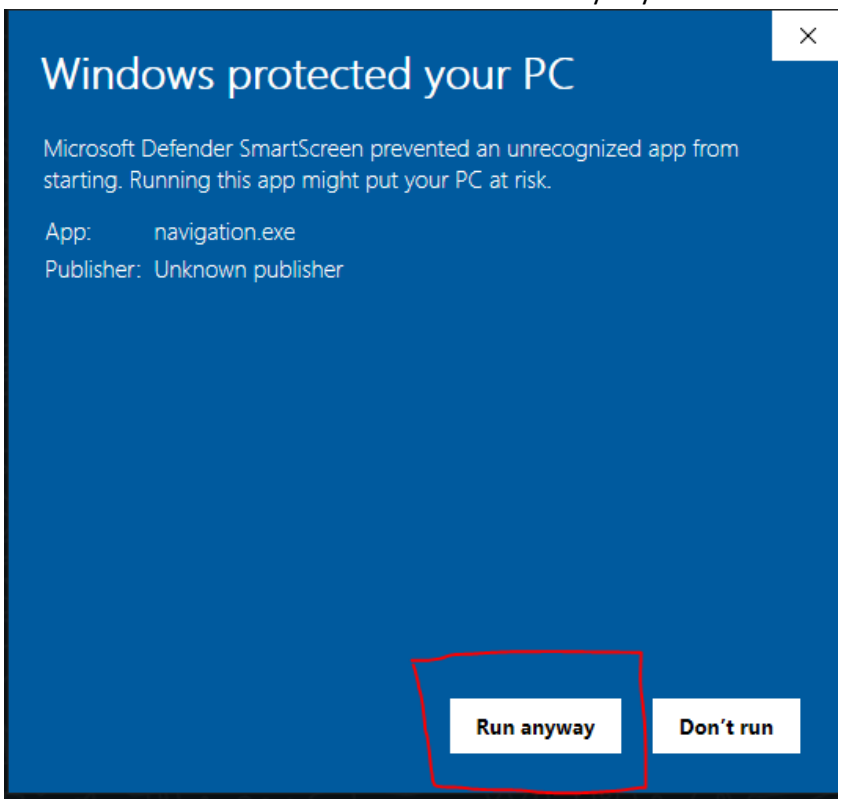
5. When you find Numerikiando.exe file, you have to double click on it, and Numerikiando application will appear.



6. If when you double click on Numerikiando.exe file appears this:

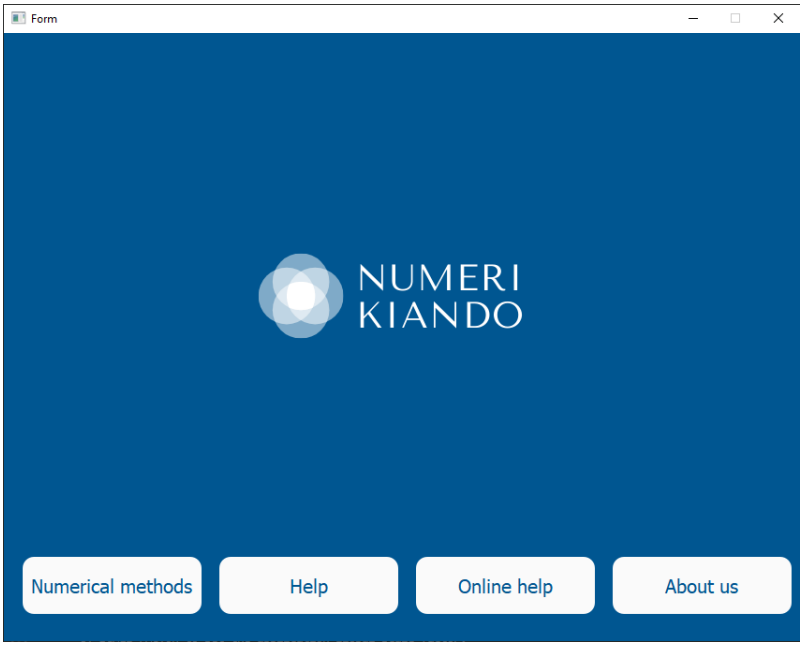


You have to click on “More info” and the “Run anyway”

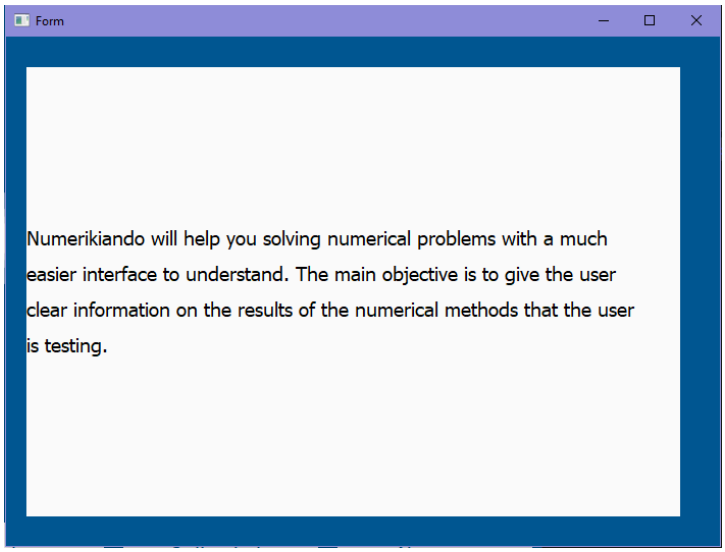


Steps to use Numerikiando:

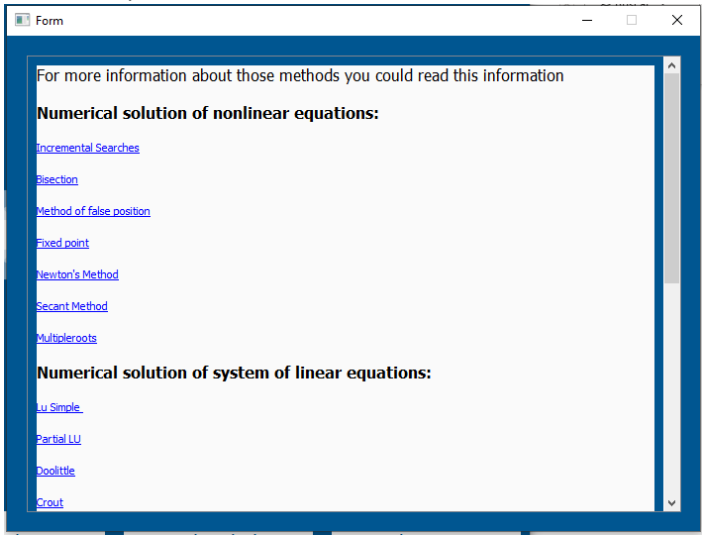
1. Click on start button (Numerical Methods) to see the available modules.



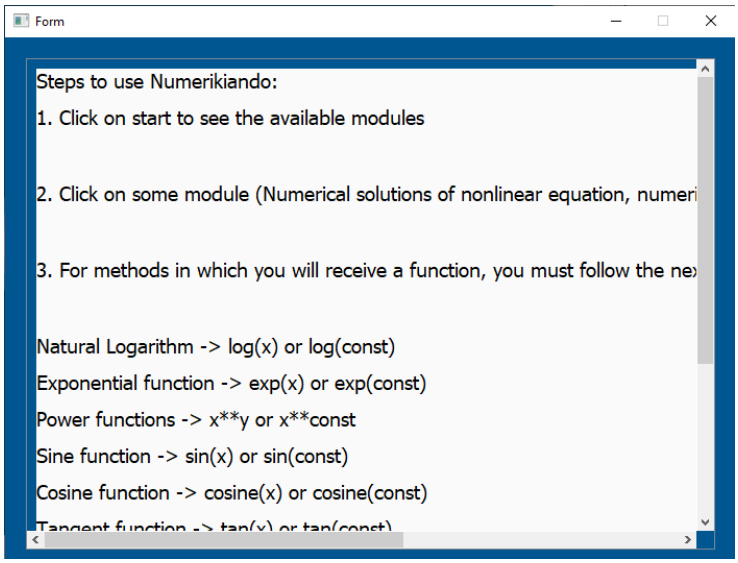
2. The buttons are:
    a. Numerical Methods: You can see all the available methods.
    b. Help: A smaller version of the user guide.
    c. Online help: Access to some videos on the internet to know more about the methods.
    d. About us: A brief description about our group and out implementation.
3. About us



4. Online help



5. Help

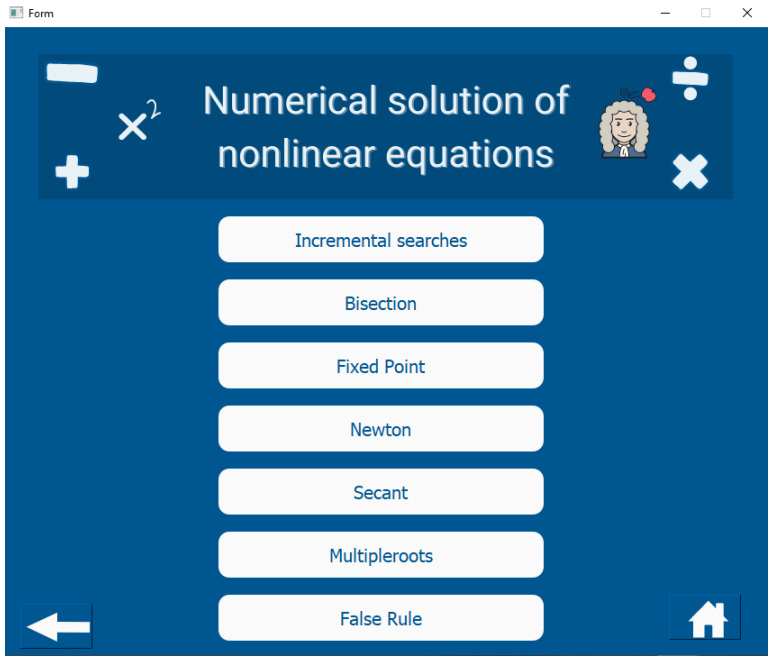


6. Numerical methods

7. Click on some module (numerical solution of nonlinear equation, numerical solution of systems of linear equations or interpolation)

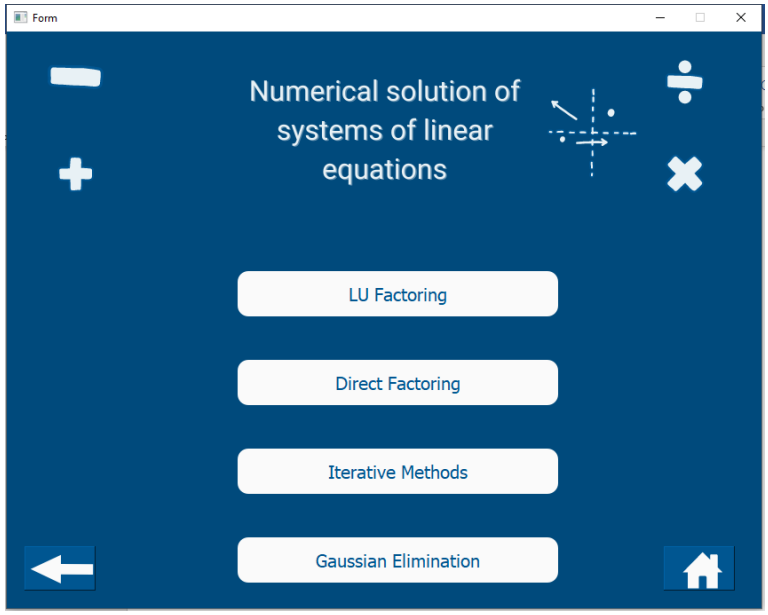
Valid modules with their input values:

8. Numerical solution of nonlinear equation



a. Incremental searches: $f, x_0, \Delta x, n$
b. Bisection: f, a, b, tol, n
c. False position: f, a, b, tol, n
d. Fixed point: $f1, g, x_0, tol, n$
e. Newton: f, f', x_0, tol, n
f. Secant: f, x_0, x_1, tol, n
g. Multiple roots: h, h', h'', x_0, tol, n

9. Numerical solution of systems of linear equations



a. LU factoring
    i. Simple LU: A, b

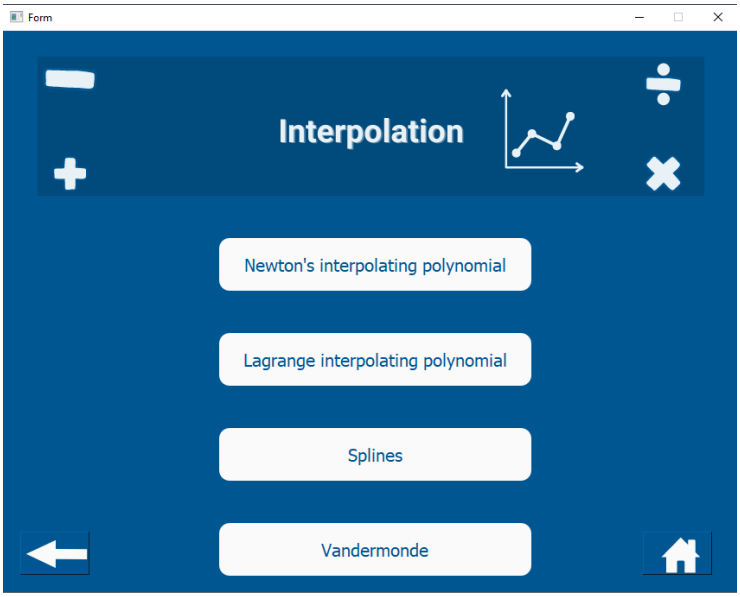
ii. Partial LU: A, b

b. Direct factoring
   i. Doolittle: A, b
   ii. Crout: A, b
   iii. Cholesky: A, b

c. Iterative methods
   i. Jacobi: A, b, x_0, tol, n
   ii. Gauss-Seidel: A, b, x_0, tol, n
   iii. SOR: A, b, x_0, tol, w, n

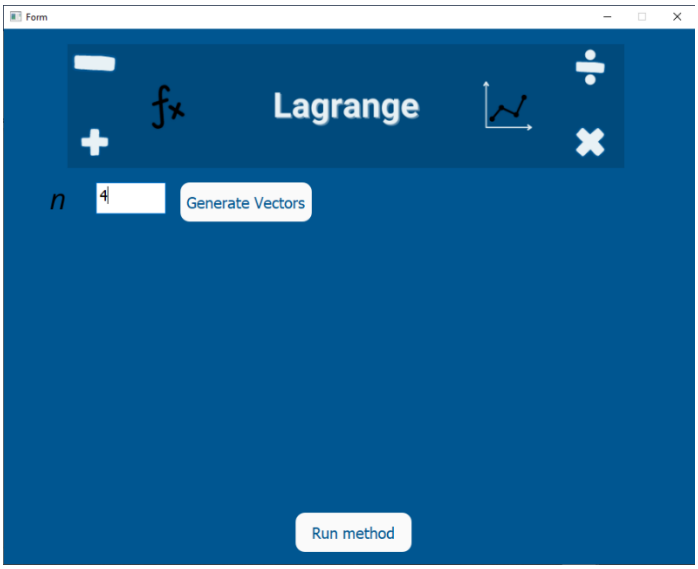
d. Gaussian elimination
   i. Simple gaussian elimination: A, b
   ii. Gaussian elimination with partial pivoting: A, b
   iii. Gaussian elimination with total pivoting: A, b

10. Interpolation

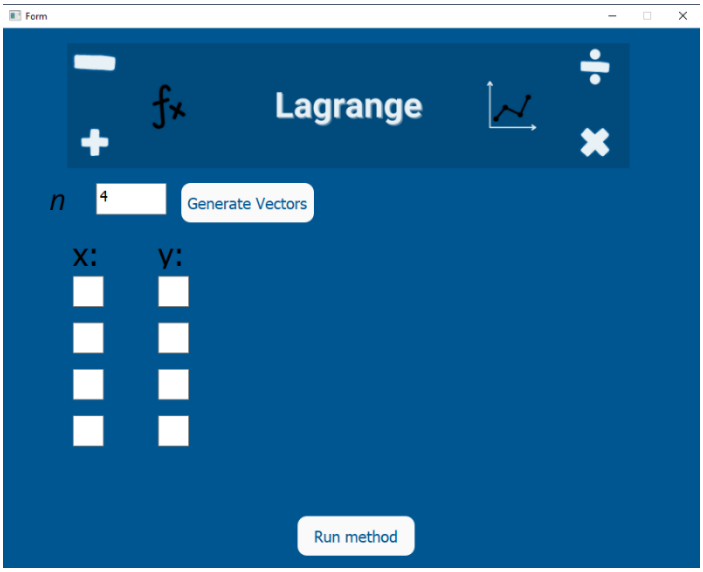


a. Vandermonde: $Tabla: x, y$
b. Newton's interpolating polynomial: $Tabla: x, y$
c. Lagrange interpolating polynomial: $Tabla: x, y$
d. Splines
   i. Linear spline: $Tabla: x, y$
   ii. Quadratic spline: $Tabla: x, y$
   iii. Cubic spline: $Tabla: x, y$

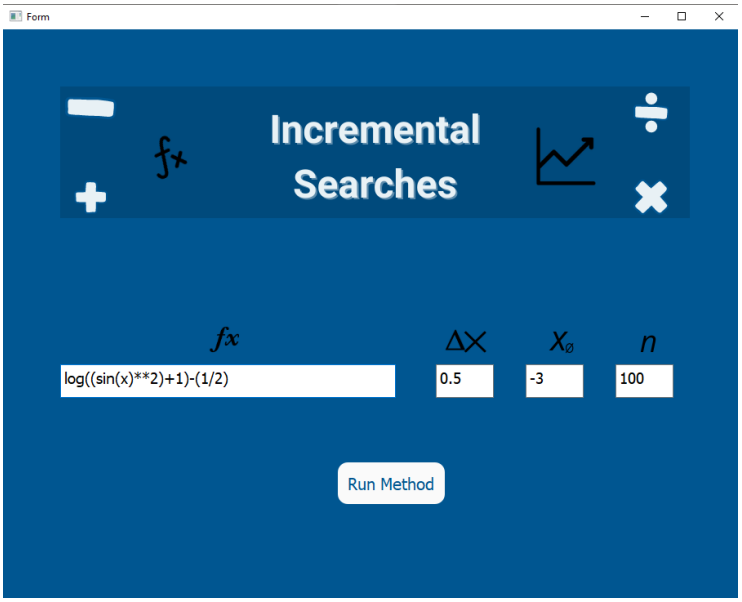
11. Additionally, as you can see on the previous methods, some of them have a matrix as their input value or a function. Here is how you should introduce the input values.
    a. Matrix
       i. First add the number of rows and columns and click on 'generate vectors'.



ii. Fill the boxes with your input values and run the method.



b. With a function you must introduce your input values and run the method as shown below.



12. Finally, here is a guide about how to introduce your functions:

Natural logarithm -> log(x)
Euler -> exp(1)
Power -> num1**num2
Sin -> sin(x)
Cos -> cos(x)
Tan -> tan(x)