USER MANUAL

Calculator by Trelico.inc

April 2020

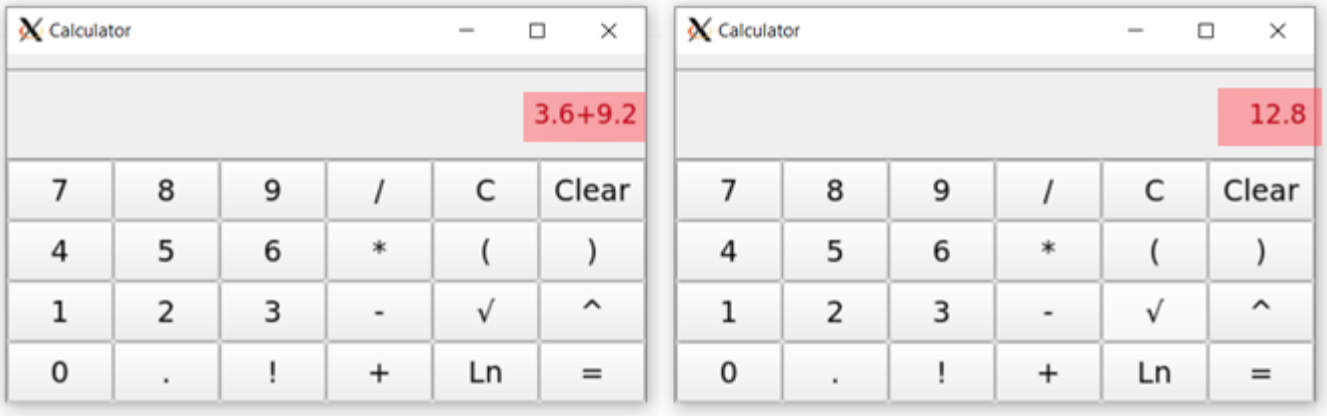
Content

1. Destination

Calculator by Trelico.inc is a program designed for counting simple mathematical problems.

The description of functions that calculator can do:

1. Addition - `def add(a, b)`
2. Subtraction - `def sub(a, b)`
3. Multiplication - `def mul(a, b)`
4. Division - `def div(a, b)`
5. Factorial - `def fac(a)`
6. Root - `def root_n(a, b)`
7. Exponentiation - `def assist_pow_x_y(a, b)`
8. Natural logarithm - `def log_n(a)`



*Img. "*Demonstration of Calculator*"*

For working with the calculator you can use both the buttons of the calculator and the keyboard. Number keys is responsible for the numeric buttons on the calculator; “.” key is responsible for the “.” button; ”+”, “-“, “*”, “/” keys are responsible for addition, subtraction, multiplication and division; key “L” is responsible for the operation of natural logarithm; key “R” is responsible for the extracting the square root from a number; the combination of „shift+`‘` key“ is responsible for the factorial calculating; “]” key is responsible for „)“ button`, the combination of „shift+`]` key“ is responsible for „(“ button; „^“ key is responsible for raising a number to a power; backspace is responsible for the „C“ button which allows deleting the last entered symbol, while the combination of „ctrl+backspace“ is responsible for the button “Clear” which DELETES ALL. An expression is created by entering numbers, operations, functions and parentheses. The calculation will be performed by pressing the "=" button of the calculator (or it is also possible to use "enter" on the keyboard to evaluate the expression), the expression will be overwritten by the result which you can use in the same way as if it were an entered number in operations of addition, subtraction, multiplication, division, raising a number to a power, extracting the square root from a number and the factorial calculating.

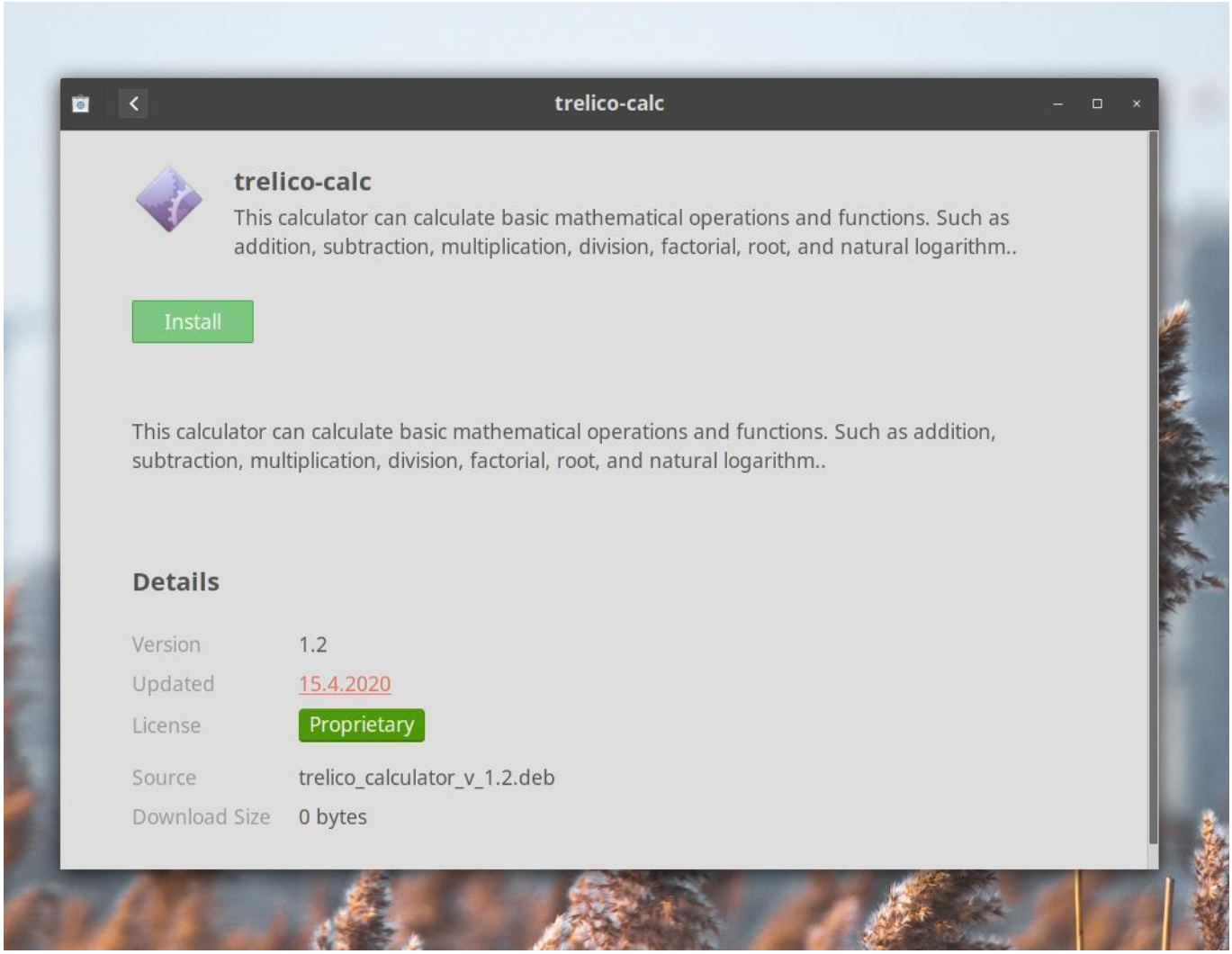
2. Preventive measures

This guide describes how to use the calculator correctly. We recommend reading this guide before using.

Do not distrupt the calculator, do not interfere in the source code of the program!!!

3. Installing, Launching and Uninstalling the Program

3.1 Installing the calculator



*Img. "*installation of Calculator*"-press `install` button*

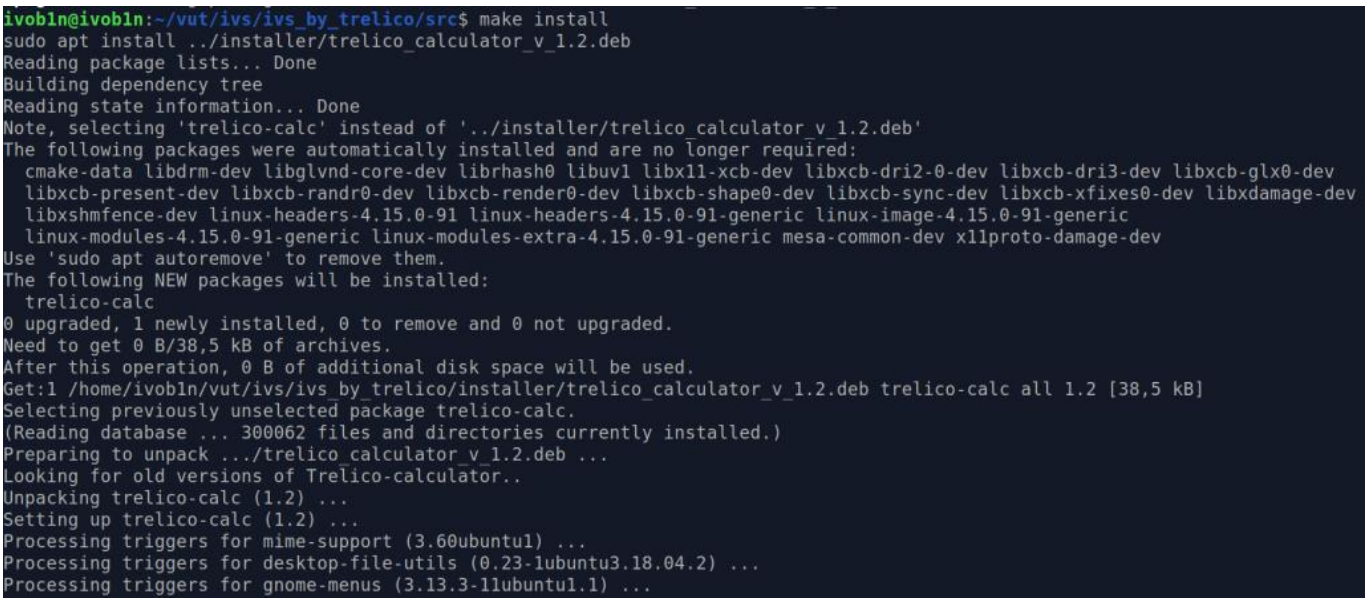
Or you can install the calculator with the help of installer:

Download the installer. You can start installation by one of the following commands:

sudo apt install ./trelico_calculator_v_1.2.deb (in `installer/` directory)

or

make install (in `src\` directory) Then the folder, which includes codes for running the calculator, will be created.



*Img. "*installation of CalculatorNo2*"*

Makefile commands:

-all (compile the project - including profiling programm)

-pack (pack project)

-clean (clean all generating files)

-test (runs math library tests)

-doc (starts generating documentation)

-run (launch the program)

-profile (starts compiling of the standard deviation calculation program into profiling)

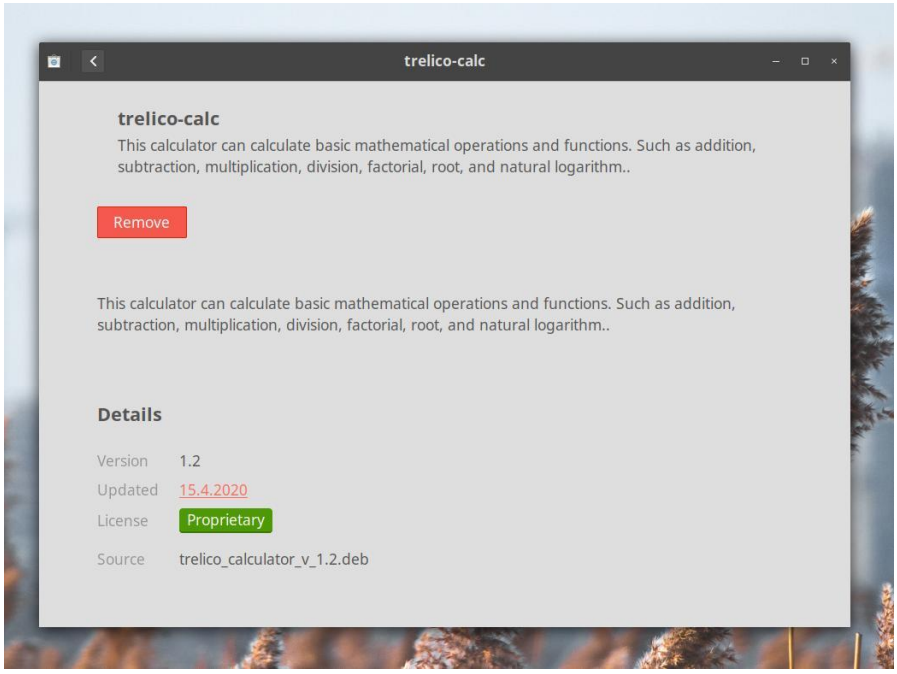
create_installer (creating installer with current src\ files in directory `installer` named `trelico_calculator_v_1.2.deb`)

3.2 Launching the calculator

The calculator can be started by the command:

trelico-calculator

3.3 Uninstalling the calculator



*Img. "*Uninstallation of Calculator*"- press `remove` button*

Or you can uninstall the calculator with the help of uninstaller:

If you want to delete this wonderful calculator for some unknown reason, write one of the following commands:

sudo apt purge trelico-calc (anywhere in terminal)

or

make uninstall (in `src\` directory)

```
ivoblin@ivoblin:~/vut/ivs/ivs_by_trelico/src$ make uninstall
sudo apt purge trelico-calc
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  cmake-data libdrm-dev libglvnd-core-dev librhash0 libuv1 libx11-xcb-dev libxcb-dri2-0-dev libxcb-dri3-dev libxcb-glx0-dev
  libxcb-present-dev libxcb-randr0-dev libxcb-render0-dev libxcb-shape0-dev libxcb-sync-dev libxcb-xfixes0-dev libxdamage-dev
  libxshmfence-dev linux-headers-4.15.0-91 linux-headers-4.15.0-91-generic linux-image-4.15.0-91-generic
  linux-modules-4.15.0-91-generic linux-modules-extra-4.15.0-91-generic mesa-common-dev x11proto-damage-dev
Use 'sudo apt autoremove' to remove them.
The following packages will be REMOVED:
  trelico-calc*
0 upgraded, 0 newly installed, 1 to remove and 0 not upgraded.
After this operation, 0 B of additional disk space will be used.
Do you want to continue? [Y/n] y
(Reading database ... 300075 files and directories currently installed.)
Removing trelico-calc (1.2) ...
dpkg: warning: while removing trelico-calc, directory '/usr/share/trelico_calc' not empty so not removed
dpkg: warning: while removing trelico-calc, directory '/usr/local/bin' not empty so not removed
Processing triggers for desktop-file-utils (0.23-1ubuntu3.18.04.2) ...
Processing triggers for gnome-menus (3.13.3-11ubuntu1.1) ...
Processing triggers for mime-support (3.60ubuntu1) ...
sudo rm -rf /usr/share/trelico_calc
```

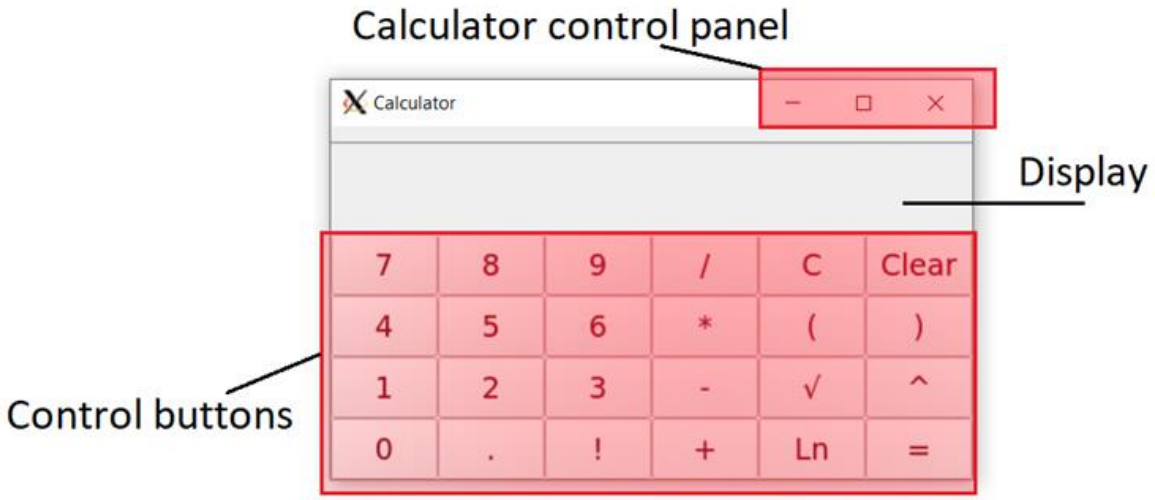
*Img. "*Uninstallation of Calculator№2*"*

4. Overview of Calculator Operations

Img. "Overview of Calculator Operations"

4.1 Calculator overview

The calculator consists of 3 functional blocks: control buttons, display and calculator control panel.



Img. "Calculator overview"

Calculator control panel:

The first "dash" button will minimize the calculator. The entire application will be moved to the background and a "re-activate" button will be placed in the 'windows' Taskbar. Pressing that button will restore the application back to your desktop.

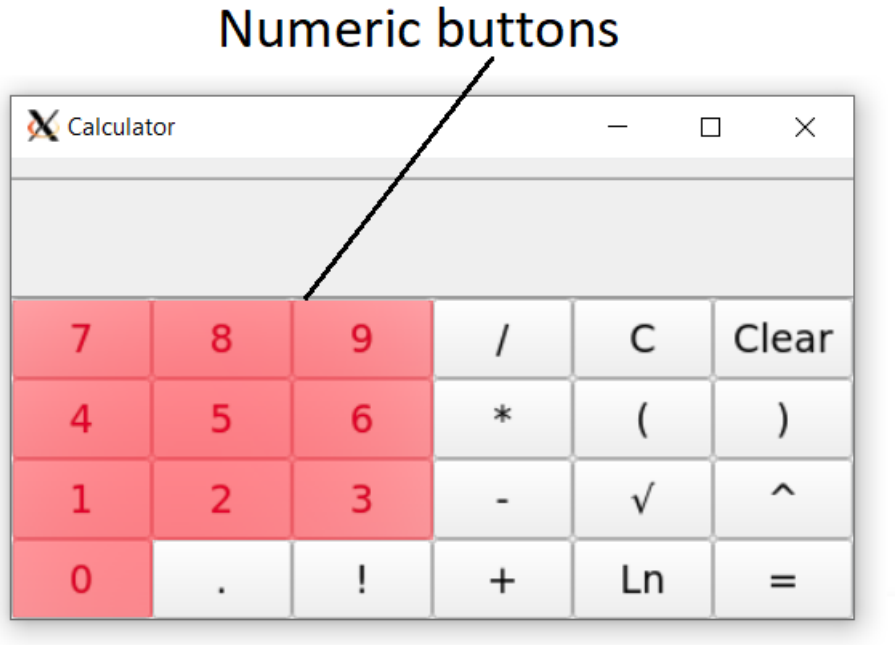
The middle button can actually have one of two shapes. Pressing the "box" will cause the calculator to maximize and fill all available space on the screen. If the calculator is already maximized then a slightly different icon image will be displayed in this middle button which looks like two windows rather than one. Pressing this middle button again while the window is maximized will return the calculator to it's original size.

The last "X" button will close the calculator. The window will be closed and disappear from the workspace.

4.2 Description of calculator buttons

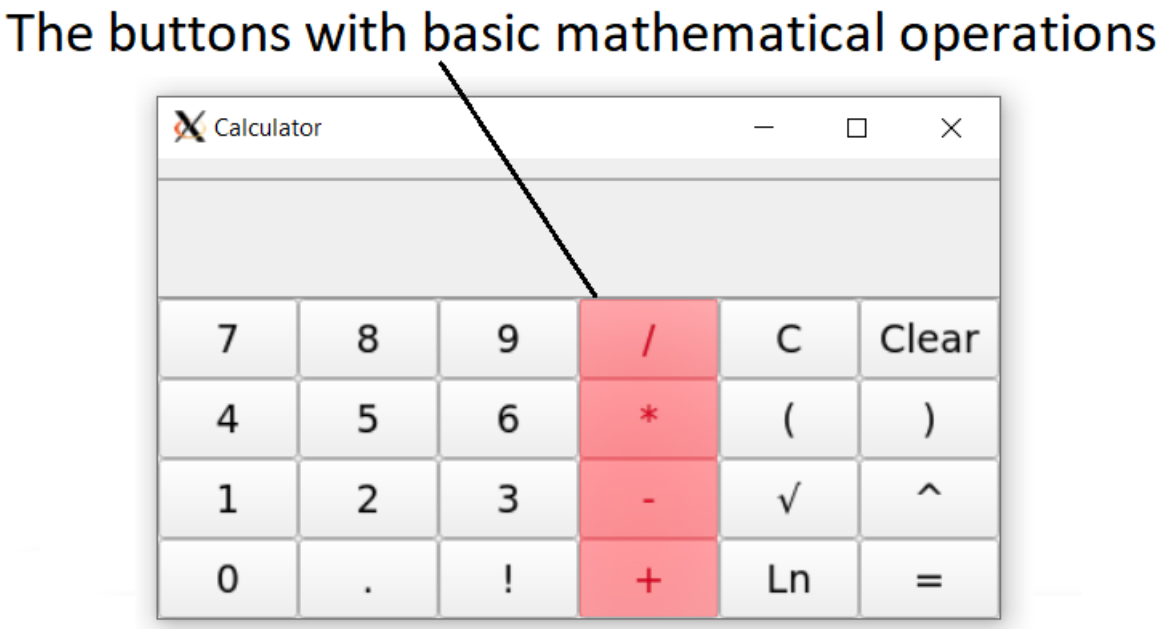
The calculator has the following types of the buttons:

1) Numeric buttons (numbers from 0 to 9): after pressing the button, the number will appear on the display



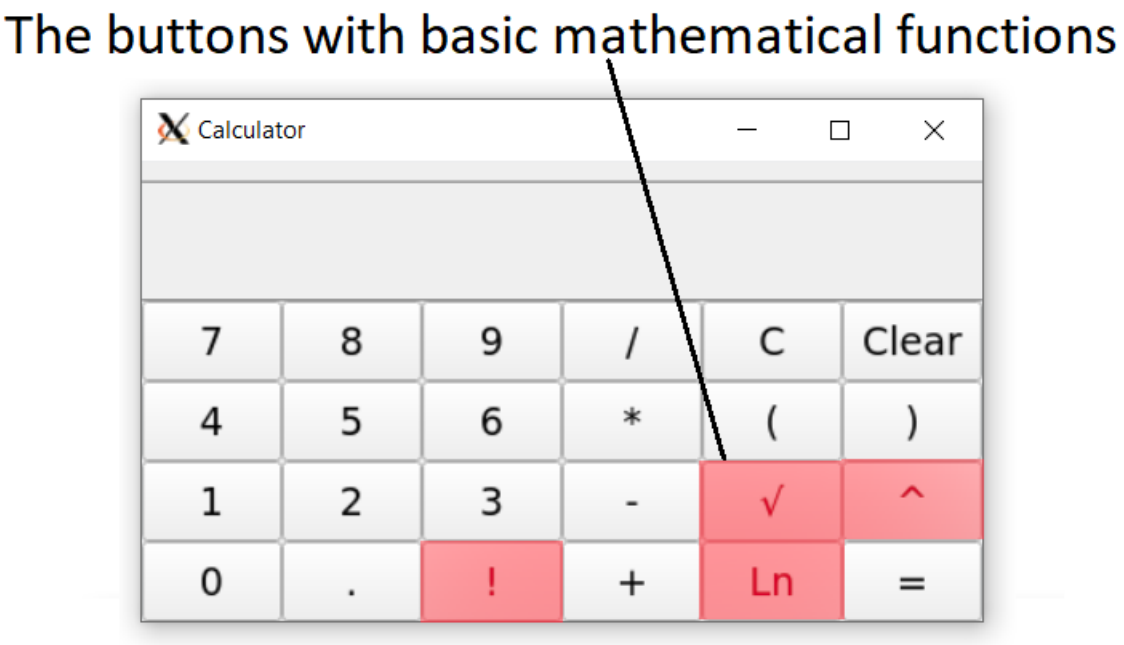
Img. "Numeric buttons"

2) The buttons with basic mathematical operations (+ , - , * , /): after pressing the button, the operation will appear on the display
   a. The button "+" is responsible for the addition. The addition function has two arguments. Arguments can be integer or fractional, positive or negative.
   b. The button "-" is responsible for the subtraction. The subtraction function also has two arguments. Arguments can be integer or fractional, positive or negative. This button is also responsible for entering negative numbers.
   c. The button "*" is responsible for the multiplication. The multiplication function also has two arguments. Arguments can be integer or fractional, positive or negative.
   d. The button "/" is responsible for the division. The division function also has two arguments. Arguments can be integer or fractional, positive or negative.



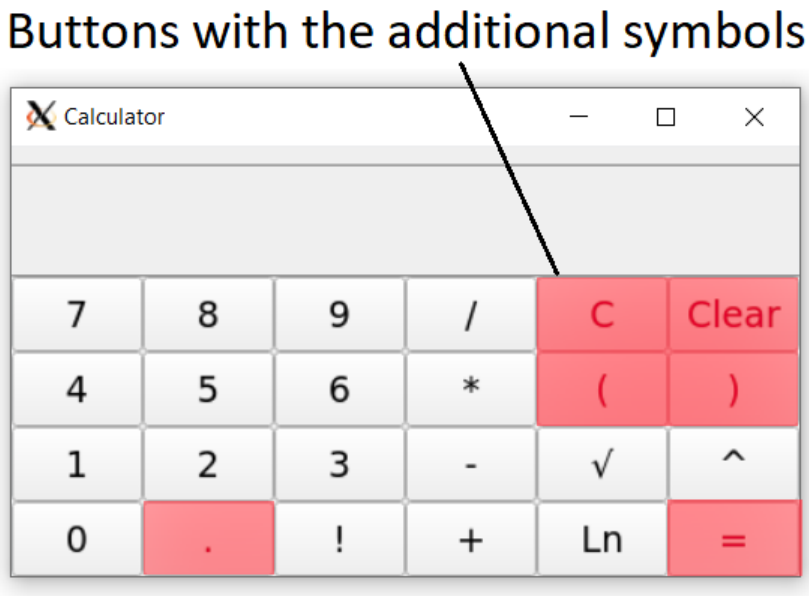
Img. "The buttons with basic mathematical operations"

3) The buttons with basic mathematical functions (^ , √ , Ln , !): after pressing the button, the function symbol will appear on the display
   a. The button "^" is responsible for the raising a number to a power. This function has two arguments and it calculates the first number passed as argument in the power of the second number passed as argument. . Arguments can be integer or fractional, positive or negative.
   b. The button "√" is responsible for the extracting the square root from a number, which should be integer positive and could be entered after or before the root button.
   c. The button "Ln" is responsible for the calculating the exponential logarithm of a number passed as argument which should be a positive number, rounded to 3 numbers after a point.
   d. The button "!" is responsible for calculating of the factorial of a number passed as argument which should be a positive integer number (numbers greater then 33 exceed display length).



Img. "The buttons with basic mathematical functions"

4) Buttons with the additional symbols ("." , "(" , ")" , C , Clear , =): after pressing the button, the symbol will appear on the display
   a. The buttons "(" and ")" allow to put expressions in brackets. (It is not implemented in this version of the calculator!)
   b. The button "." separates the integer part of number from the fractional part of number.
   c. The button "=" allows to display the result of the entered expression.
   d. The button "C" allows deleting the last entered symbol.
   e. The button "Clear" DELETES ALL!!!



Img. "Buttons with the additional symbols"