# Calc Manual

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## I. Introduction

Calc is a fully-featured calculator written in Rust for education purpose, it was designed to be minimalistic but then went off the rails and a lot of feature where implemented.

Now Calc is a powerful calculator capable of exact rational computation, matrix and vectors algebra, bindings to gnuplot and terminal plotting, with dozens of updates and currently (as of writing this manual) in version 2.11.4.

If you prefer a website you may want to read **The Online Book** which is always up to date.

#### I.1. Install

You can install it via cargo



Visit Calc to see all the install page

### I.2. Contributors

Name	Role	Website
Charlotte THOMAS	Main developer/ Maintener	Personal Page
Léana 江	Help, cleanup	Website/Blog

### II.1. Basic operators

Calc have the basic operators which are

- + for the addition
- - for the substraction
- \* for the multiplication
- / for the division (or for a rational)
- ^ for the exponentation

#### II.2. Variables

It also supports variable the syntax is

```
1 myvar = value
```

for example

```
1 var = (2+2)
```

```
ð<sup>3</sup>Σx<sup>2</sup>: ../../target/release/mini-calc
Welcome to calc v2.0.0 by Charlotte Thomas
type help for getting help for the commands

> var = 5
> var +1
6
>
```

Figure 1: Example of setting a variable

## II.3. Built-in variables

The following variables are built-in:

- pi is pi as a double precision float
- e is e as a double precision float

## III. Functions

## III.1. Implemented

The following functions are currently implemented:

### Trigonometry

- sin (vectorized)
- cos (vectorized)
- tan (vectorized)

## Hyperbolic trigonometry

- sinh (vectorized)
- cosh (vectorized)
- tanh (vectorized)

### Reverse trigonometry

- acos (vectorized)
- asin (vectorized)
- atan (vectorized)

### **Exponentiation**

- exp (vectorized)
- In (alias: log) (vectorized)

#### **Vectors**

• norm

#### **Matrices**

- det
- invert

#### Plot

- plot
- termplot

#### **Other**

- sqrt (vectorized)
- factorial (alias: fact)
- abs
- ceil
- floor
- round

# III.2. Trigonometry

For trigonometry, the input is assumed to be in radians, if it is in degrees you need to add false or true as a second argument, example shown bellow.

```
charlotte > .../calc > № add_functions ! 💩 v1.73.0 💌 16:03 🔘 11s
ð<sup>3</sup>Σx<sup>2</sup>: ../../target/release/mini-calc
Welcome to Calc v2.3.0 by Charlotte Thomas, type help for help
> help
 Calc v2.3.0 Help
> info : show infos
> exit : exit the program
> help : print this help
> verbose : toggle the verbose
> version : prints the version
> cos(pi)
-1
> cos(180,true)
-1
> cos(180)
-0.5984600690578581
```

Figure 2: Usage of trigonometry

## III.3. Exp/1n

If you use the exp function you can pass as a second argument the base you want to use if no second arguments are passed it will used the natural base.

Figure 3: Usage of exp/ln

### III.4. Root

You can specify in second argument an integer to take the nth root, if not it take the square root.

Figure 4: Usage of sqrt

### III.5. Partial function

The calculator's language supports partial function.

```
Welcome to Calc v2.7.0 by Charlotte Thomas, type help for help
> log10(x) = log(x,10)
> \exp 10(x) = \exp(x,10)
> log10(exp10(2))
2.00000
> log10(exp10(3))
3.00000
> log10(exp10(3.2))
3.20000
> log10(exp10(3.4))
3.40000
> cos_degrees(x) = cos(x,true)
> cos_degrees(180)
-1.00000
> cos degrees(90)
0.00000
```

Figure 5: Example of a partial function

### III.6. Vectorization

Functions have been vectorized.

```
Welcome to Calc v2.10.0 by Charlotte Thomas, type help for help > sqrt([1,4,9,16,25])
"[1.00000,2.00000,3.00000,4.00000,5.00000]
> _____
```

Figure 6: Example of a vectorized function

# IV. Configuration

You can configure the general color, greeting message, greeting color, prompt and prompt color in a toml file found for example on linux in

```
1 ~/.config/mini-calc/mini-calc.toml

@Bash

pini-calc.toml x |
1 general_color = 'purple'

[greeting]
4 greeting_message = 'Welcome to Calc %version% by %author%, type help for help'
5 greeting_color = 'blue'

[prompt]
8 prompt = '> '
9 prompt_color = 'cyan'
```

Figure 7: Example of the default configuration

### IV.1. Colors

Available colors are

- blue
- black
- purple
- green
- cyan
- red
- yellow
- white
- an hexadecimal color (ex: #f7d8a8)

The default color (or if your colour can't be parsed) is cyan

## IV.2. Example of a modified configuration

```
mini-calc.toml
general_color = 'cyan'

[greeting]
greeting_message = 'Heya! This is calc! Version %version%, and I think coded by %author% but who knows!'
greeting_color = '#f7a8d8'

[prompt]
prompt = 'λπ: '
prompt_color = '#55cdf'
```

Figure 8: Example of a modified config

#### it looks like

Figure 9: Modified configuration in action

### IV.3. Interact in the command line

You can interact in the command line with the config, the commands are

- config: show the config help
- config reload: reload the config from the file
- config reset: reset the config
- config show: show the current config
- config set <category> <value>

## categories are:

- greeting\_message
- greeting\_color
- prompt\_color
- prompt
- general\_color

```
Melcome to Calc v2.8.0 by Charlotte Indoma, type metry to metry config.

The greeting colour is set to blue which prints which will be come to Calc xeversions by Sauthors, type metry for help that so the general colour if you've medified your config and it doesn't look good, the author (Charlotte Thomas) declines any responsabilities.

> config show
The greeting colour is set to blue which prints Welcome to Calc Xeversions by Kauthors, type help for help The prompt is > in cyan
Main color is purple which looks like this is the surface of th
```

Figure 10: Example of interaction in the command line of config

# V.1. Implemented operators

The following operators have been implemented:

```
or (alias: ||)
and (alias: &&)
geq (alias: >=)
leq (alias: <=)</li>
gt (alias: <)</li>
lt (alias: <)</li>
```

## V.2. Example

```
Welcome to Calc v2.4.0 by Charlotte Thomas, type help for help
> true
true
> false
false
> true && false
false
> true || false
true
false
> 1 < (1+1)
true
> (1+2) >= cos(1)
true
> let = false
> !let
true
> !let && (1+2) >= cos(1)
```

Figure 11: Example of logic