User Manual

xnguye27 **xkloub03** **xmorav48**

Contents

1. Overview

The calculator app is a versatile tool that is designed to perform various mathematical calculations quickly and accurately.

The app has a user-friendly interface that enables users to input mathematical expressions using traditional or scientific notation. Users can also input the angle measure in degrees or radians. The calculator app provides quick access to trigonometric functions using dedicated buttons, making it easy to calculate trigonometric ratios in a matter of seconds.

Additionally, the app supports advanced features such as inverse trigonometric functions, logarithmic, combination, factorial and exponential functions. The app also includes a memory function that allows users to store intermediate calculations and recall them when needed.

The calculator app also has a history feature that allows users to view their previous calculations and results. This feature makes it easy for users to track their progress and review their work.

These features make the calculator app a versatile tool that can handle a wide range of mathematical calculations. Whether users need to perform basic arithmetic operations or more advanced calculations involving trigonometric functions, combination numbers, nth roots, square roots, logarithms, or factorials, this calculator app provides a quick and easy solution.

Overall, this calculator app is an essential tool for anyone who needs to perform mathematical calculations that involve trigonometric functions. Its user-friendly interface and advanced features make it a valuable tool for students, teachers, engineers, and anyone who needs to perform complex mathematical calculations.
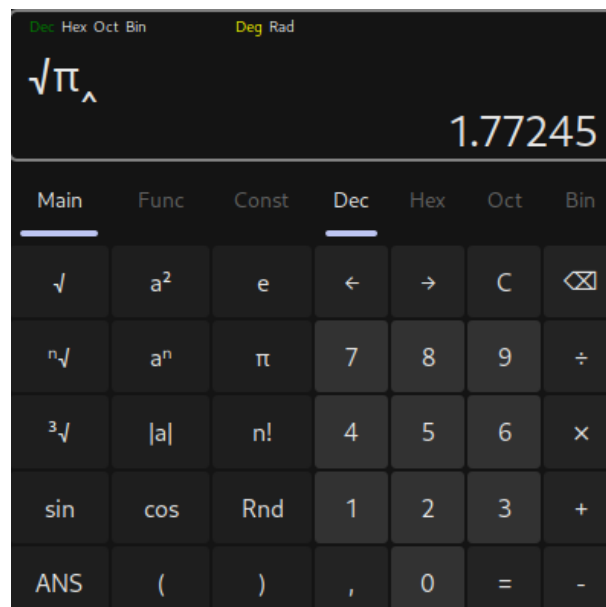

Figure 1: Program's interface

2. System Requirements

2.1. Minimum system requirements:

- Ubuntu 16.04 or later, or Windows 10 (or newer) operating system
- At least 8MB of RAM
- Intel Celeron processor or equivalent
- 50MB of free hard drive space

2.2. Recommended system requirements:

- Ubuntu 20.04 or later, or Windows 10 (or newer) operating system
- At least 16MB of RAM
- Intel Pentium 4 processor or equivalent
- 100MB of free hard drive space

Note that while the app can be built from source on other Linux systems, we cannot guarantee its compatibility or performance on those systems.

3. Installation

This section outlines the steps to install the calculator app on your system. The app can be installed using an installer or built from source, depending on your preference.

3.1. Using Installer

1. Download the installer package from the app website or any authorized source.
2. Double-click on the installer package to start the installation process.
3. Follow the on-screen instructions to complete the installation process.
4. Once the installation is complete, launch the calculator app.

3.2. Build From Source

If you wish to build our Calculator App from source, please note that the following system dependencies are required:

- **Git**: This is a version control system that is used to clone our source code repository onto your system.
- **Make**: This is a build automation tool that simplifies the build process by automatically building and linking source files.
- **libgtk2.0-dev**: This is a development library for GTK+ version 2.0, which is required for building the graphical user interface of our Calculator App.
- **libgtk-3-dev**: This is a development library for GTK+ version 3.0, which is also required for building the graphical user interface of our Calculator App.
- **GCC**: This is a compiler that is used to compile the source code into executable code.
- **Rust**: The programming language that our Calculator App is written in. (Don't be mistaken with the Rust game)

We recommend that you install these system dependencies before proceeding with the build process. Please refer to the documentation for your specific operating system for instructions on how to install these dependencies.

After having all of these dependencies installed on your system, follow these steps to build the app

1. Clone the project repository

   ```
   git clone https://github.com/FIT-IVS-segmentation-fault-core-dumped/IVS-projekt-2/
   ```

2. The source code is inside the `src` folder, moving there and build it using `make`

   ```
   cd IVS-projekt-2/src
   make build
   ```

3. The App is now located in the `target/release` folder, now copy it into your `bin` folder.

Congratulations! You have successfully installed the calculator app on your system.
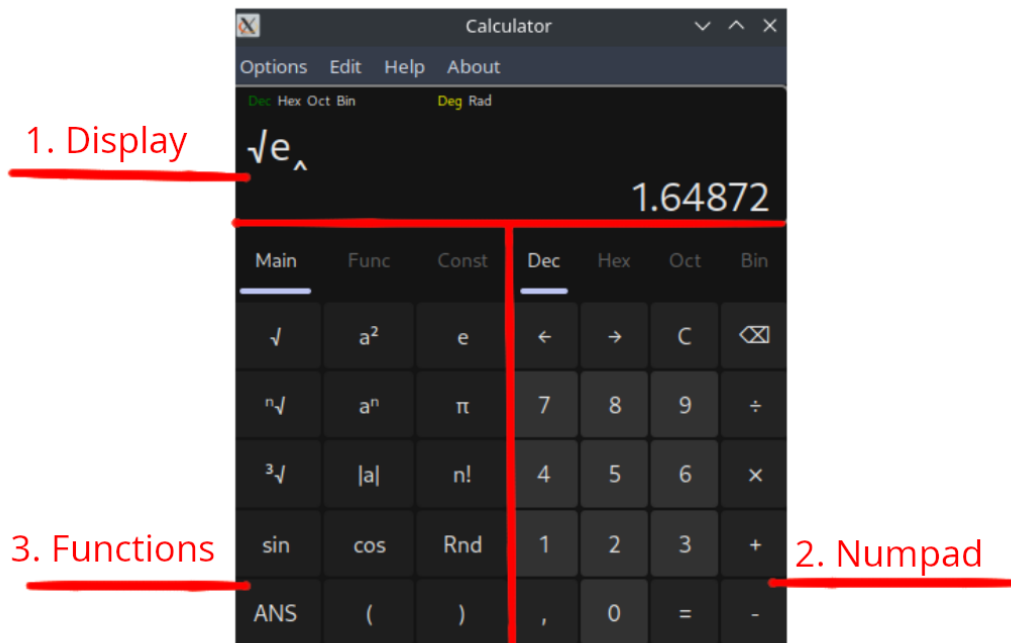
4. Usage

Figure 2: Program's usage

The calculator app has a user-friendly interface that allows you to perform mathematical calculations quickly and easily. There are 3 sections in the interface, here is basic overview of them:

1. **Display Section**:
   - The Display Section is where you can see your input and output.
   - To start, select your desired mode (binary, octal, decimal, hex) and angular unit type (degree, radiant) from the top of the display.
   - Use the numpad on the right side to enter your mathematical expression.
   - You can use the cursor to navigate and edit your expression as needed.
   - The result of your calculation will be displayed on the right side of the display.

2. **Numpad and Basic Operator Section**:
   - The Numpad and Basic Operator Section contains the basic arithmetic operators (+, -, x, /) as well as other basic operators such equal sign and clear button.
   - Use the numpad to enter the numbers and operators required for your calculation.
   - Click on the corresponding button to add the operator to your mathematical expression.

3. **Function Button Section**:
   - The Function Button Section contains a range of mathematical functions to help you perform more complex calculations.
   - Use the tabs to navigate to the Main Tab, Func Tab, or Const Tab.
   - Click on the corresponding button to add the function to your mathematical expression.
   - Use the ANS Button to insert the last answer in your current calculation.
   - Use the Random Button to generate a random number.
   - Use parentheses to group your expression as needed.

4.1. Display Section

The calculator app comes with a display section that allows you to see the current mode (binary, octal, decimal, hex) and angular unit type (degree, radiant), user input, and calculation results.

- **Current Mode and Angular Unit Type**:
  The display section shows the current mode and angular unit type at the top of the app window.
  The current mode can be changed by clicking on the corresponding button in the function buttons section.
  The angular unit type can also be changed by clicking on the corresponding button in the function buttons section.

- **User Input**:
  The user input section is located below the current mode and angular unit type display.
  You can enter your mathematical expression in this section using the numpad or by typing on your keyboard.
  The cursor will show your current position within the expression.

- **Calculation Result**:
  The calculation result is located on the right-hand side of the user input section.
  Once you have entered your expression, press the "=" button or hit enter on your keyboard to calculate the result.
  The result will be displayed in this section.

- **Modes**:
  The calculator app supports four modes: binary, octal, decimal, and hex.
  To change the current mode, click on the corresponding button in the function buttons section.
  The current mode will be displayed at the top of the display section.

- **Angular Unit Type**:
  The calculator app supports two angular unit types: degrees and radians.
  To change the current angular unit type, go to the menu `Options` into `Angular Unit`.
  The current angular unit type will be displayed at the top of the display section.

Congratulations! You have successfully used the display section to input your mathematical expression and view the calculation result, as well as change the current mode and angular unit type.

4.2. Numpad and Basic Operators

The calculator app comes with a numpad and basic operator section that allows you to input mathematical expressions using basic arithmetic operators.

- **Input Modes**:
  You can chose to switch between modes for your input, it can be Binary, Octal, Decimal or Hex.

- **Numpad**:
  The numpad is located on the right-hand side of the app window. It contains the digits 0-9, as well as decimal point, clear button (C), and delete button (⌫). Click on the corresponding buttons to input your mathematical expression.

- **Basic Operators**:
  The basic operator buttons are located in the middle of the app window. They include addition (+), subtraction (-), multiplication (*) and division (/). Click on the corresponding button to add the operator to your mathematical expression.

- **Cursor**:
  On the top left there are two arrow (<- and ->) to change the current cursor's position by one step to the left or right respectively.

- **Order of Operations**:
  The calculator app follows the order of operations when calculating expressions. The order of operations is as follows: Parentheses, Exponents, Multiplication and Division (from left to right), Addition and Subtraction (from left to right).

- **Clear and Delete**:
  The clear button (C) clears the user input section, allowing you to start over with a new expression. The delete button removes the character before the cursor in the user input section.

Congratulations! You have successfully used the numpad and basic operator section to input your mathematical expression using basic arithmetic operators. Remember to follow the order of operations and use parentheses as necessary to ensure accurate calculations.

4.3. Functions

The calculator app comes with a Function Button section that allows you to access a range of functions to help you perform complex mathematical calculations.This section has three different tabs, each with a specific purpose, you can change between them by clicking onto it.

- **Main Tab**:
  The Main Tab is the default tab in the Function Button section. It contains a range of mathematical functions, including parentheses, ANS for the last answer, nth root, square root, cubic root, power, exponential, absolute value, constants E and PI (π), factorial, random number, sin, and cos. Click on the corresponding button to add the function to your mathematical expression.

- **Func Tab**:
  The Func Tab contains more advanced mathematical functions, including sin, cos, tan, cot, arcsin, arccos, arctan, arccot, logarithm, natural logarithm, log10, and modulo. Click on the corresponding button to add the function to your mathematical expression.

- **Const Tab**:
  The Const Tab allows you to declare your own constants for use in your mathematical expressions. Click on the "Const" button to access this tab. Enter the name and value of your constant in the input fields provided, and click "+" to save it. Your constant will now be available in the current (Const) tab for use in your expressions.

Also good things to keep in mind

- **Parentheses**:
  The parentheses buttons are located in the bottom of both Main and Func tab. They include open parenthesis "(" and close parenthesis ")". Click on the corresponding button to add the parentheses to your mathematical expression. Remember to follow the order of operations and use parentheses as necessary to ensure accurate calculations.

- **ANS Button**:
  The ANS Button is located in the Main Tab and allows you to use the last answer in your current calculation. Click on the ANS Button to insert the last answer into your mathematical expression.

- **Random Button**:
  The Random Button is located in the Main Tab and allows you to generate a random number. Click on the Random Button to insert a random number into your mathematical expression.

- **Nth Root**:
  The nth root function ($^n\sqrt{}$) in our Calculator is somewhat special in its usage. To use it, you will need to follow these steps:
  1. Input the wanted root base.
  2. Press the nth-root button.
  3. Input the number that you want to compute the root from.

     For example, if you want to compute the cube root of 8, you would input "3" for the root base, press the $^n\sqrt{}$ button, and then input "8". The result should be "2".

Congratulations! You have successfully used the Function Button section to access a range of mathematical functions to help you perform complex mathematical calculations.

5. Authors

- **xkloub03**: GUI, testing, Czech translator
- **xmorav48**: GUI, testing, Slovak translator
- **xnguye27**: Math library, User's manual, Icon design, Japanese + Vietnamese translator