

SmartCalc

Raik410

December 2023

1 Introduction

SmartCalc is an advanced calculator application designed to offer both speed and versatility for a variety of mathematical operations. Its efficiency is largely attributed to the implementation of Reverse Polish Notation (RPN) and an optimized stack-based computation method, allowing for rapid and accurate calculations.

2 Features

2.1 Algebraic and Geometric Calculations

SmartCalc excels in handling a wide range of algebraic and geometric calculations. It simplifies complex expressions and solves various algebraic equations, extending its utility to geometric problem-solving.

2.2 Advanced Mathematical Functions

SmartCalc supports an extensive array of advanced mathematical functions, enhancing its utility for various scientific and engineering tasks:

- Computes cosine: `cos(x)`
- Computes sine: `sin(x)`
- Computes tangent: `tan(x)`
- Computes arc cosine: `acos(x)`
- Computes arc sine: `asin(x)`
- Computes arc tangent: `atan(x)`
- Computes square root: `sqrt(x)`
- Computes natural logarithm: `ln(x)`
- Computes common logarithm: `log(x)`

2.3 Graph Plotting

The ability to plot graphs of functions visually represents how mathematical functions behave, making it an invaluable tool for both educational and professional use.

2.4 Credit Calculator

A dedicated module for calculating credit payments makes SmartCalc a versatile tool for financial planning, allowing users to compute various parameters related to credit and loans.

2.5 User Interface and Manual Input

With its user-friendly interface, SmartCalc caters to a broad audience. The support for manual input ensures that it is as intuitive as traditional calculators.

3 Build System and Makefile Targets

SmartCalc's build system includes several targets in its 'Makefile' for ease of development and maintenance:

- `all`: Compiles the entire project.
- `install`: Installs the compiled application.
- `uninstall`: Removes the installed application.
- `clean`: Cleans up build files.
- `dvi`: Generates documentation in DVI format.
- `dist`: Creates a distribution package of the project.
- `test`: Runs the test suite.
- `gcov-report`: Generates a test coverage report.

4 Conclusion

SmartCalc is not just a calculator; it's a comprehensive tool for a wide range of mathematical and financial calculations, boasting a user-friendly interface and advanced features. It's designed to cater to the needs of students, educators, and professionals alike.