User Manual for
Sci-Calculator

1. Basic Operations

- Addition and Subtraction (**ParseExpressionAddSub**)
- Multiplication and Division (**ParseExpressionMultDiv**)
- Modulo (**Modulo**)
- Square Root (**Sqrt**)
- Absolute Value (**Abs**)
- Prime Factorization (**PrimeFact**)

2. Mathematical Functions

Trigonometric functions:

- Sine (**Sin**)
- Cosine (**Cos**)
- Tangent (**Tan**)
- Arcsine (**ArcSin**)
- Arccosine (**ArcCos**)
- Arctangent (**ArcTan**)

Logarithmic and Exponential functions:

- Logarithm (base 10) (**Log**)
- Natural Logarithm (**Ln**)
- Exponential (**Exp**)

*3. Configuration Settings (**Edit**)*

- Edit angle unit (**'D'** for Degrees, **'R'** for Radians, **'G'** for Gradians)
- Enter new value to memory

4. Memory Management and Read Memory

- Read the value stored in memory (**ReadMem**)

*5. Unit Conversions (**Convert**) US to Metric*

- Length conversions: inches to centimeters and vice versa

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- Area conversions: square feet to square meters and vice versa
- Volume conversions: cubic inches to liters and vice versa
- Weight conversions: pounds to kilograms and vice versa
- Temperature conversions: Fahrenheit to Celsius and vice versa

6. Exiting the Calculator

- Exit the calculator (**0** or by selecting 'Exit' in the menu)

Usage Instructions:

Run the program and choose an option from the menu:

- Enter a number corresponding to the desired functionality.
- Follow the prompts to input values and perform calculations.
- For arithmetic operations, input expressions as requested.
- For mathematical functions, input the number to calculate the function.

Configure the calculator:

- Edit settings for angle units or memory values using the 'Edit' menu option.

Access conversions and memory:

- Use the 'Conversions' menu to convert units.
- Use 'Read Memory' to display the value stored in memory.

Exit the calculator:

- Choose 'Exit' from the menu to exit the calculator.

For mathematical functions requiring angle units:

- Edit the angle unit in ‘Edit’ if needed.

Miscellaneous:

Mixing Different Operator Types

- If the user combines operators from different groups (e.g., mixing **+** or **-** with ***** or **/**), an error message is displayed, and the function prompts the user to correct the expression.

Undefined Characters

- When undefined characters are entered (e.g., "2a3 -gt5"), the parser ignores these characters and performs the calculation based on the valid numeric elements. For instance, "2a3-gt5" will be computed as “23-5”

Handling Odd Numbers with Multiple Points

- If the user inputs a number with multiple decimal points (e.g., "2.5.673"), the parser ignores the extra points and considers the number as "2.5673."

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Missing or Consecutive Operators

- When an operator is left at the end of an expression (e.g., "4++5") or there are consecutive operators (e.g., "4+5+"), the missing or extra operator is interpreted as zero. For example, "4++5" or "4+5+" will be processed as "4+0+5 = 9" and “4+5+0=9”.

Pattern and General Handling

- In handling these scenarios, the parser aims to maintain continuity and perform calculations based on valid numeric elements while ignoring non-numeric characters or interpreting ambiguous operator combinations. The goal is to allow the user to continue their calculations seamlessly by disregarding invalid elements and attempting to resolve any ambiguities in expressions involving operators.

Note: Ensure to follow the instructions prompted by the program for input and selection.

This user manual provides an overview of the available functionalities in the Sci-Calculator program. Follow the on-screen prompts and input requirements for desired calculations and settings adjustments.