Features Manual

User Manual for `e` and `ln` Features in the Calculator App

This user manual provides a detailed guide on how to use the `e` (Euler's number) and `ln` (natural logarithm) features in our calculator app, including examples.

Introduction

The `e` and `ln` functions expand the capabilities of your calculator app, allowing users to perform scientific and mathematical calculations efficiently.

1. `e` **Function**: Computes the value of Euler's number (e≈2.718) or multiplies it by a number.
2. `ln` **Function**: Computes the natural logarithm (ln) of a given number.

Using the `e` Function

How It Works

The `e` button allows you to:

1. Add e (Euler's constant) to a calculation.
2. Multiply a number by e.

Steps

1. Open the calculator app.
2. Enter a number.
3. Tap the `e` button:
    - If a number is already entered, the calculator app appends `e` to it (e.g., `3e`).
4. Tap the `=` button to calculate:
    - **Example**: Pressing `3` → `e` → `=` returns 3×e=8.154845.

Using the `ln` Function

How It Works

The `ln` button computes the natural logarithm, which is the inverse of the exponential function.

Steps

1. Open the calculator app.
2. Tap the `ln` button.
   - This adds `ln()` to the input field.
3. Enter a number inside the parentheses (e.g., `ln(5)`).
4. Tap the `=` button to calculate:
   - **Example 1**: Pressing `ln` → `5` → `=` returns ln(5)=1.609438.
   - **Example 2**: Pressing `5ln` → `2` → `=` returns 5×ln(2)=3.465736.

Error Handling

For Both Features

- **Invalid Input**: If the input is not a valid expression (e.g., `invalid` or `2+3e`), the app returns:
  - **Question**: Keeps the invalid input.
  - **Answer**: Displays `"Error"`.

`ln` Function

- **Input Constraints**: The natural logarithm (ln(x)) is undefined for x≤0. If such an input is detected, the app returns Error:
  - **Question**: Keeps the invalid input (e.g., `ln(-5)`).
  - **Answer**: Displays `"Error"`.

Tips for Usage

1. **Avoid Redundant Input**:
    - Pressing `e` multiple times after a number does not append extra `e`s.
    - Example: `5e` → `e` remains `5e`.
2. **Clear Input for Complex Expressions**:
    - For operations like `2 + 3e`, clear the input or use parentheses for manual calculations.
3. **Ensure Valid `ln` Input**:
    - Always input a positive number inside `ln()`.

Contact for Support

If you encounter any issues, please contact the development team at robinsonq4@mymail.nku.edu