

Calculating in Scratch

Difficulty: Advanced

Concepts: Variables, conditionals, loops, simple algorithms/program design

1 Problem Description

The Scratch language makes it easy to program simple games and animations, but we can use it for other tasks as well. For this assignment, you will create a (somewhat limited) calculator, similar to the standard calculator application on nearly all computers.

Your calculator needs to handle the following operations:

- Addition
- Subtraction
- Multiplication
- Division
- Exponentiation

In addition, your calculator only needs to deal with whole (integer) numbers. As a result, your final calculator should have a total of 17 buttons: ten for numeric digits, the five operations above, an equals button and a clear button. Each button should give a visual cue (like briefly flashing or changing colors) when it is clicked.

To make things simpler, we will impose a **significant limitation** on your calculator's behaviour. Your calculator only needs to be able to handle two operands at a time, and you should assume the user will always press the 'equals' button after each pair of operands.

For example, if the user presses '1 0 + 2 =', your calculator will display a result of 12. However if the user presses '1 0 + 2 + 3 =', your calculator will display a result of 5 (the first 10 is ignored). The way to combine more than two operands using your calculator is through extra use of the 'equals' button: pressing '1 0 + 2 = + 3 =' should yield a result of 15.

You can, of course, later extend your program by adding sounds or other animations when buttons are pressed.

Good luck and happy calculating!