

## Project phase 0 — Warm-up exercise in Java programming — assigned Tuesday 26 August, due Tuesday 2 September

Task: Write a Java program to emulate Emacs Calc.

In detail:

Emacs Calc is a sophisticated calculator package for use within the Emacs editor. It is installed on UNM CS machines, and can be invoked from Emacs with the command `M-x calc`. It has an extensive help facility. If you wish, you can download the source code from <http://www.synaptics.com/people/daveg/>. A printed manual is also available, at <http://www.cs.unm.edu/~darko/classes/2003f-351/calc.pdf>.

Your calculator only needs to cover a tiny subset of Emacs Calc's functionality.

Only the following commands need to be recognized:

- numbers
  - both integer and floating-point numbers (including floating-point numbers with exponents) must be accepted, but all numbers are internally stored and displayed as floating-point numbers (Java type `double`)
- binary arithmetic operators
  - `+`
  - `-`
  - `*`
  - `/`
  - `^`
- unary mathematical functions
  - `Q`,  $\sqrt{\cdot}$
  - `L`,  $\ln \cdot$
  - `E`,  $e^{\cdot}$
  - `S`,  $\sin \cdot$ , angle in degrees
  - `C`,  $\cos \cdot$ , angle in degrees
  - `T`,  $\tan \cdot$ , angle in degrees
  - `fT`,  $\arctan \cdot$ , angle in degrees
- stack manipulation commands
  - **tab** In Emacs Calc, hitting the **tab** key swaps the two topmost items on the stack. In your calculator, the user must type the command name `exch` and hit **return**.

Unlike in Emacs Calc, typing the single-character operators such as `+` need not take effect immediately; the user must hit carriage **return**.<sup>1</sup>

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<sup>1</sup>If you are comfortable writing user interfaces in Java, specifically graphical user interfaces using Swing, you can of course mimic the behavior of Emacs Calc more closely. This is not required for the homework.

## How to turn in

Turn in your code by running

*~barrick/handin your-file*

on a regular UNM CS machine.

You should use whatever filename is appropriate in place of your-file. You can put multiple files on the command line, or even directories. Directories will have their entire contents handed in, so please be sure to clean out any cruft.