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APP assignment 3 - Command Line Graphing App

Overview

- takes user input and prints a representation of a graph to the terminal
    - first asks for a function in the form of a lambda expression, then asks for x and y lower and upper bounds
    - then prompts for further action from the user (e.g. print graph, add function, remove function, etc)
- uses #lang racket
- input can be directed in to the program using bash redirection
    - i.e. $ racket grapher.scm < input.txt
- multiple functions can be graphed at once, with different symbols.

Functions

- functions can be added in the form of a lambda expression or procedure
- examples:
    - + ; y=x line
    - (lambda (x) (* x x)) ; simple parabola
    - (lambda (x) (if (> x 0) (sqrt (- 16 (* x x))) 1e13)) ; top right quarter of a circle
- there are no protections against malicious lambda functions, that would be overly complicated (see if you can break something fun)
- functions can be deleted by choosing a function to delete based on what symbol it uses

Symbols:

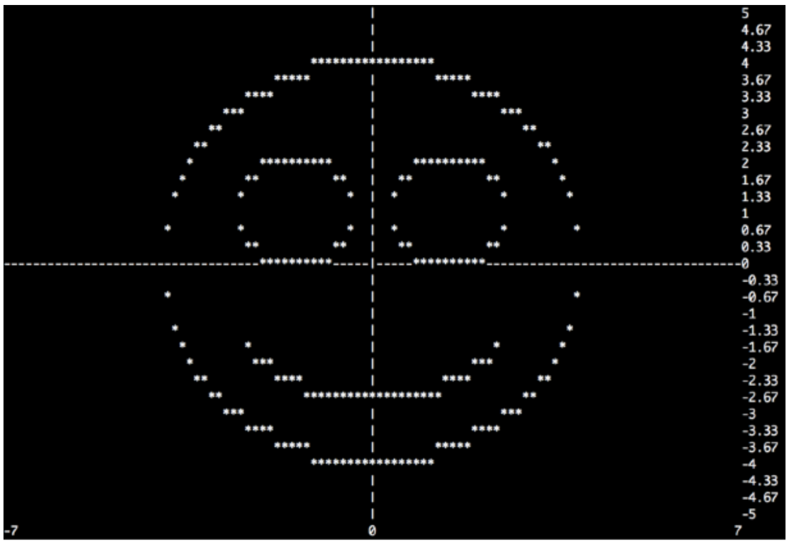
- single character
- a-z, A-Z, =,+,-,$ and other characters may be used. period . and backslash \ may not be used. there is no built-in protection against this.

Functional Programming

- the program still by most respects conforms to good functional programming practices (not printing as a by-product, no object oriented methods, etc). This is achieved by instead of displaying line-by-line, each line is an appended string of characters, and the lines are appended together in to one very large string. then, that string is printed.
- this method is probably tough on memory but easy on IO and largely conforms to functional programming

Testing

- some test cases are provided. face.txt uses circles to make a face, and heart.txt uses complex curves and conditionals to make a heart-shape (based on the formulas provided by https://shannonsookochoff.wordpress.com/valentines-math/graphing-a-heart-on-your-ti-xx/, 2011)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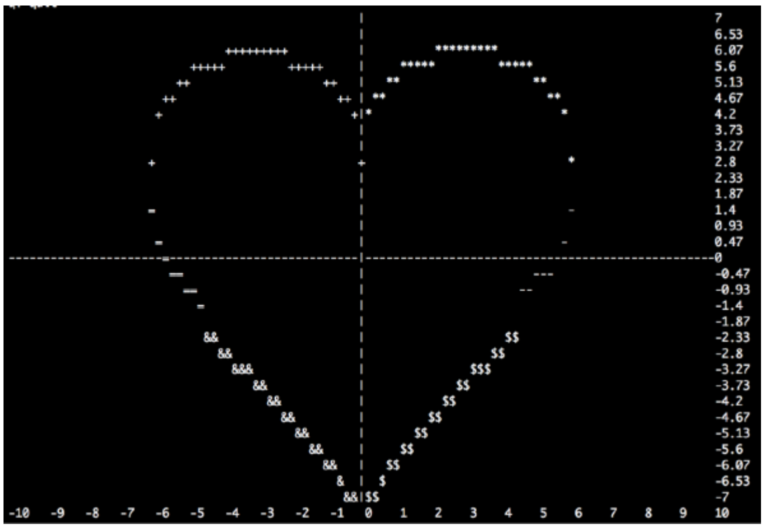
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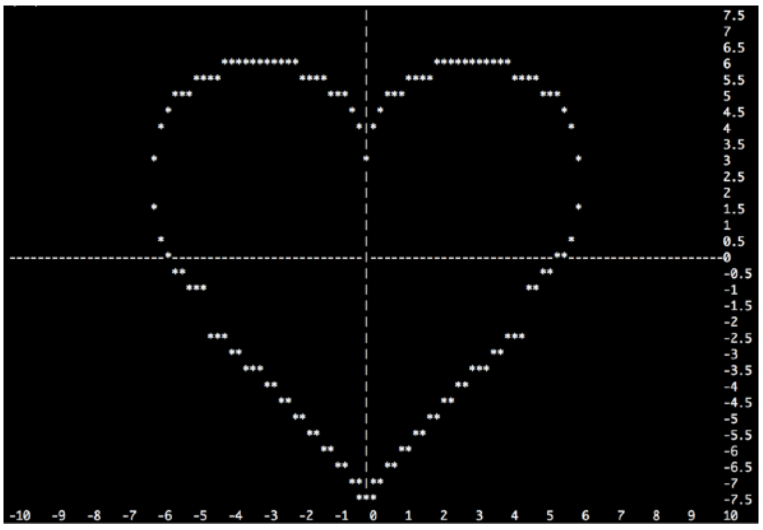
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