

Program 1

12 points

Due: September 5, 2008 at 11:59 p.m.

Functions and Basic Variable Types in C

The purpose of this programming assignment is to familiarize the student with C syntax, the use of functions in C, and working with a variety of C variable types.

You are to write two C functions where all the formal parameters and the returned values are doubles:

1. A function that returns the $\log_3(x)$.
2. A function that computes the **Euclidean distance** between two points in a three dimensional space. The function will take as input two points specified by the coordinates (x_1, y_1, z_1) and (x_2, y_2, z_2) .

Main Assignment

This assignment is similar in flow to the **Lab 1** program. Assume the first integer read with `scanf` specifies the number of coordinate pairs to read in. Your program should only read in one pair of coordinates each time `scanf` executes. However, the coordinates are to be read in as integers.

For each pair of points, compute and print out (using `printf`) the Euclidean distance.

After all the coordinate pairs have been read in, compute and print out the average Euclidean distance.

Finally, compute the \log_3 of the average Euclidean distance. In addition to printing out the double value of \log_3 of the average Euclidean distance, produce a horizontal bar graph of `ceil(log3(average Euclidean distance))`.

What to turn in for Program 1

An official test file will be made available a few days before the due date. Turn in your assignment using the *turnin* program on the CCC machines. You should turn in a tarred file that includes your source code and a README file. Note, you may include a *make* file if you are already familiar with *make*. However, this is NOT a requirement for program 1 because the plan is to work with *make* in Lab 2.