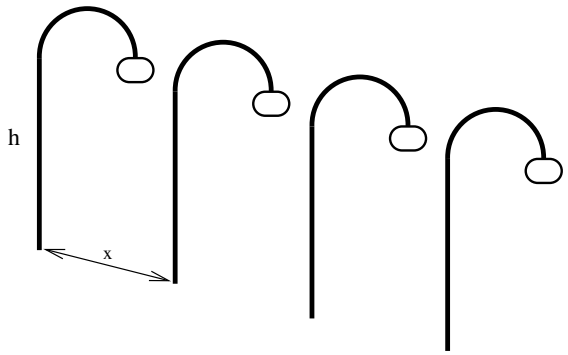
Programming Project #3
EGRE245 Fall 2017
Illumination

1 Overview

Consider a street lit by four street lamps (of C watts each) on lamp posts of h meters high that are positioned x meters apart in a straight line, i.e.



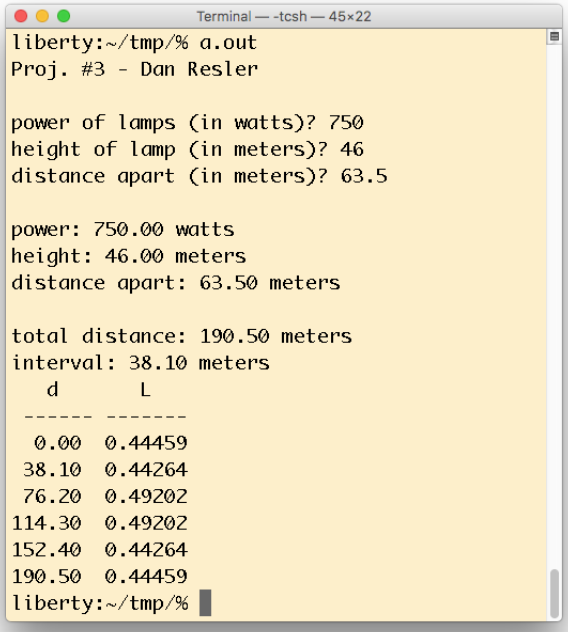
The intensity of illumination L, in candelas, produced by each lamp of height h and power C at a point d from the posts is given by

$$L = \frac{C \cdot h}{(h^2 + d^2)^{1.5}}$$

The level of illumination at any one point can therefore be found by adding up the contributions of each of the four lamps.

Write a complete C program that inputs the power of each lamp C, each lamp's height h, and their distance apart x, and then outputs the intensity of illumination every i interval on the straight line under the lamps where each i distance represents $\frac{1}{5}$ the total distance between the first and last lamps. Note that you are also printing the total and interval distances. Store all floating-point values in variables of type `float`. You will need to use one or more routines from `math.h`; be sure to use the correct ones (e.g. `powf`) for your data types! Echo print all input. You may assume that all measurements are in meters. For simplicity sake you may also assume that each light source is exactly h meters *directly above* a pole's position, and that the posts themselves do not block any light. You should format and label your output exactly like it is done in the sample run below (using your name instead of mine).

2 Sample Run



3 Deliverables

You should turn in a stand-alone, complete application program (your source code) containing a `main` function. Name your source code file `proj3`*XXXX*`.c` where *XXXX* is the last 4 digits of your student id number. For example, if your student id number is V12345678, your file will be named `proj35678.c`. Projects this term will be submitted via the web using a link off of the class web page. Be sure to document your code in the manner described in class.

Due date: Tuesday, September 26