Homework Project 1

Given 09/17/2014, Due 10/07/2014

The aim of this project is to create a program that takes a set of segment obstacles as input, as well as a start and target point, and shows the shortest path between them. It provides a visual feedback by drawing the points, obstacles, and the path on the screen using the `xlib` interface.

The program takes one command-line argument, a file name. The following lines give the set of line-segment obstacles in the format

```
S (20,100) (55,63)
```

The point coordinates are integers. You can parse these files easily with `scanf`. There are less than 1000 obstacles.

As first stage, your read the input, and display the line-segments in a window. Then you get two left mouseclick events, which give the start and target point of the shortest path. Then you construct a graph; the vertices are the two points given by the mouseclicks, and all end points of obstacles. Any pair (p, q) of these points forms an edge of the graph if the line segment pq is not intersected by any of the obstacle line segments; if (p, q) is an edge, then its length is the euclidean distance of p and q. Finally you run a shortest-path algorithm on this graph, and display the resulting path on the screen. Repeat this as long as the user inputs point pairs with left mouseclicks; when you receive a right mouseclick, end the program.

The programming language is C or C++; test your code before submission using the `gcc` or `g++` compiler. Please remove all dead code; try to program as clearly as possible, since I try to read it. Do not copy code from another student.

Submit your source code by e-mail to `peter@cs.ccny.cuny.edu`; include your name and the homework number in the subject line, as well as in a comment in the homework file. If you submit multiple files, you can pack them with the `tar` archiver.