## Homework Project 4

### Given 11/24/2015, Due 12/15/2015

The aim of this project is to solve a traveling salesman problem, optimally if the number of points is at most 20, and approximate the solution beyond that. Your program has two input modes: if it gets started with a command line argument, then that is the file which contains the points, with two coordinates per line. The coordinates are integers in the range 0 to 500. If the program gets started without a command line argument, then you can enter points interactively by mouseclick (left mouseclick enters a point, a right mouseclick ends the input phase).

After you have all the points, you compute and display a TSP solution. If the number of points is less than twenty, you use the Held-Karp algorithm to compute the optimum TSP tour. If the number is greater than 20, you sort the points according to the first coordinate, divide the set into groups of at most twenty, and solve each group optimally; after that, you find the optimal connection between the groups.

You use again the xlib system to open a window and draw the results; draw the points black, and the lines in a color. Print the total length of the tour to stdout.