Assignment #6: Euclidean Travelling Salesperson Tour

Write a Java Program that takes as input (via standard input) a list of coordinates of cities and finds a near-optimal (or optimal) Euclidean Travelling Sales Person (TSP) Tour.

In a Euclidean TSP, the cities are given as coordinates, and the distance between two cities is the Euclidean distance. For example, if city 1 is at (x_1, y_1) and city 2 is at (x_2, y_2), the distance between the cities is $\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$.

Input Format

The first line of input contains an integer n with the number of cities to visit. The next n lines contain an x and y coordinate for each city.

Output Format

The first line of output should contain the Euclidean distance of the tour that you found. The remaining lines should contain the coordinates of the cities in the order that you visit them in your near-optimal tour. (Note that there is a sample output that is given for the tour ordering in the sample input. You should verify that you are correctly calculating the tour length).

Grading Rubric

Note that the ordering provided in the sample input gives a tour length of 1,981,782,441

Assuming that you are correctly calculating the tour length, and you output is a permutation of the cities, then your grade on the assignment will be:

$$g = -1.009 * 10^{-5} * t + 224$$

where

t is the length of the near optimal tour that you find.

Do not simply submit the sample output, since this would be worth -19,772 points.