CS430 Project

Due: 11:59PM, Nov. 21, 2013.

Problem Description: Consider a straight line L in the plane. A finite set T of targets are located above the line L, and a finite set S of wireless sensors are located below the line L. A sensor s can monitor a target t if and only if the Euclidean distance between s and t is at most one. Suppose that each sensor $s \in S$ has a positive cost $c(s)$ and each target $t \in T$ can be monitored by at least one sensor in S. Consider a subset S' of sensors in S. S' is said to be a cover if each target in T is covered by at least one sensor in S'. The cost of S' is the total costs of the sensors in S'. The objective is to compute a cover S' of minimum cost. Please develop a polynomial time algorithm and write a program to implement it.

You may form a team of up to three members. You may use any language (*e.g.*, C/C++/JAVA) to implement; and if the language you use is not supported by the TA's computer, you must use your own computer to demo your program. Your program should be able to accept a file input (*e.g.* TXT file) and you may choose the format of the input file associated with the problem.

Project Report: You are required to submit a project report by the due date to Blackboard which includes

- algorithm design and pseudocode, a proof of correctness, an analysis of the running time;

- a well commented source code;

- test source data and output;

- a separate README file describing the compiling and the execution of your program..

Project Demo: You are required to demonstrate your program to the TA and answer the questions raised by the TA.