

3 Sensor Network

A wireless sensor network consist of autonomous sensors scattered in an environment where they monitor conditions such as temperature, sound, and pressure.

You are a researcher working on a government grant in the Amazon rainforest. In this project, a wireless sensor network gathers environmental information. The Amazon rainforest stores an amount of carbon equivalent to a decade of global fossil fuel emissions, and it plays a crucial role in the world's oxygen-transfer processes. Because of the huge size of this forest, changes in the forest affect not only the local environment but also global climate by altering wind and ocean current patterns. The goal of the project is to help scientists better understand earth's complex ecosystems and the impact of human activities.

You have a working hypothesis and to test your hypothesis, you need to find a subset of sensors in which each pair of sensors can communicate directly with each other. A sensor can communicate directly with any other sensor having distance at most d from it. In order for the experiments to be as accurate as possible, you want to choose as many sensors as possible.

As one does not simply waltz into the Amazon rainforest, you cannot add new sensors or move those that are currently in place. So, given the current locations of the sensors, you need to find the largest subset satisfying the criteria. For simplicity, the location of each sensor will be a point in the two-dimensional plane and distance will be the standard Euclidean distance.

Input will be in the form of a list of coordinates in the two-dimensional plane in the files `sensors.txt`. The distance d will be the first line of the file. Every subsequent line will consist of a point x, y in the plane.

You will return a file called `chosen.txt` that consists of a subset of these points, one per line as in the input file.