

4 Cleanup

You are a summer intern for a scientist of an advanced race of aliens living in m -dimensional space. He/She/It has been performing experiments and has left sensors and equipment lying all over the the universe. He/She/It has successfully completed the experiment and is now looking to clean up the sensors that have been strewn all over the universe. As he/she/it does not want to waste too much of his/her/its valuable time cleaning up, he/she/it has assigned you to go do it. You will need to map out the shortest path through m -space to gather up all of the sensors. You may assume that your supervisor has the ability to teleport you to the first point and will also be able to teleport you back from that same point once you've finished the job.

Each sensor should be thought of as residing at a point in m -dimensional space. You will be given n data points in m -dimensional Euclidean space in the file `points.txt`. There will be a single point with m comma-separated coordinates on each line. Your goal will be to identify the shortest path you can find from point to point that touches each exactly once and returns to the starting point. When traveling from one point to another, it is assumed that you will always move in a perfectly straight line.

You may choose to start at any point you want. The output file `path.txt` will consist of a permutation of the points/lines in the input file. You should assume that the final step in your path is from the last point you list back to the first (though you may assume that you teleport into whatever point in the plane you choose to start at).

For this assignment, you will receive only one instance. Your grade will be based on the quality of your answer to that single instance. You may submit solutions until you are happy with your grade or until the deadline. Please be careful: Your solution will be marked incorrect if you don't exactly copy each point's coordinates and write a newline after each.