Explain

Resume : Explain why your algorithm runs in polynomial time.

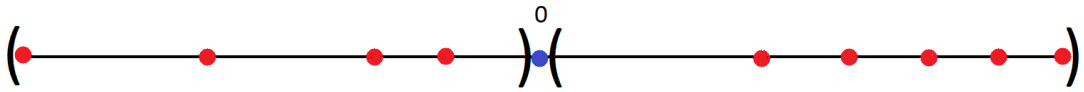
By Charles PARMENTUER & Julien VAN LERBERGHE

1. What is a Polynomial Algorythm

An algorithm is polynomial (has polynomial running time) if for some k,C>0, its running time on inputs of size n is at most Cn^k. Equivalently, an algorithm is polynomial if for some k>0, its running time on inputs of size n is $O(n^k)$. This includes linear, quadratic, cubic and more. On the other hand, algorithms with exponential running times are not polynomial.

2. How works our algorithm

First, we sort our list of points, and we loop on it until there is no more remaining. In each loop, we check if it's worth to go on the left or on the right.



((Number of points / Distance between first and last point) / Distance to go to the first point)

And we move to the next point in the chosen direction.

3. Is the algorithm polynomial?

Our algorithm uses only one loop. Using the Big-O Notation, we can determine that our algorithm has a running time of $O(n^1)$ so it is running in polynomial time.