

Closest Pair Report

Andreas Bitzilis, Christos Grigoriou and Dimos Zikos

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Results

Our implementation produces the expected results on all input-output file pairs.

The following table shows the closest pairs in the input files wc-instance-14.txt. Here n denotes the number of points in the input, and (u, v) denotes a closest pair of points at distance d .

n	u	v	d
14	(-0.5, 0.0)	(-0.125, 3.0)	3.0234

Implementation details

We resort by y-coordinates in each recursive step. For the comparison of points close to s in S_y we inspect 15 points, as explained (5.10) of Kleinberg and Tardos, Algorithm Design, Addison–Wesley 2008. Here is the corresponding part of our code:

```
min = Double.MAX_VALUE;
count ;
    for (Point s : Sy)
        count = 0;
        for [int l = 0 ; l < Sy.length; i++]
            if(count++ > 16)
                break;
            if (s.distance(Sy[i]) < min)
                min = s.distance(S[i]);
```

We combine the information from the recursive calls in linear time, thus from Eva Tardos, Algorithm Design, 5.10 the running time is $O(n \log n)$.