



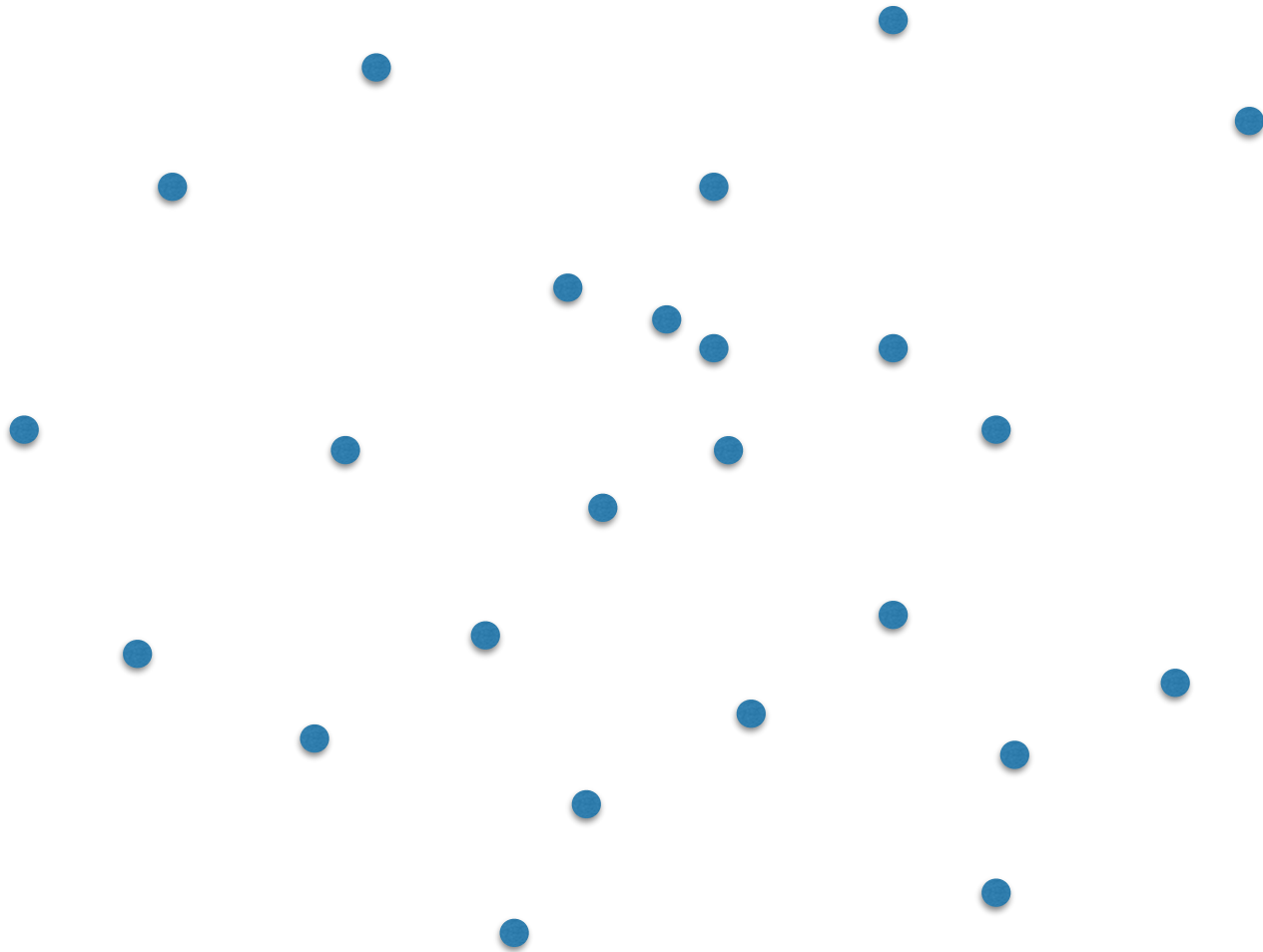
Finding the closest pair

Computational Geometry [csci 3250]

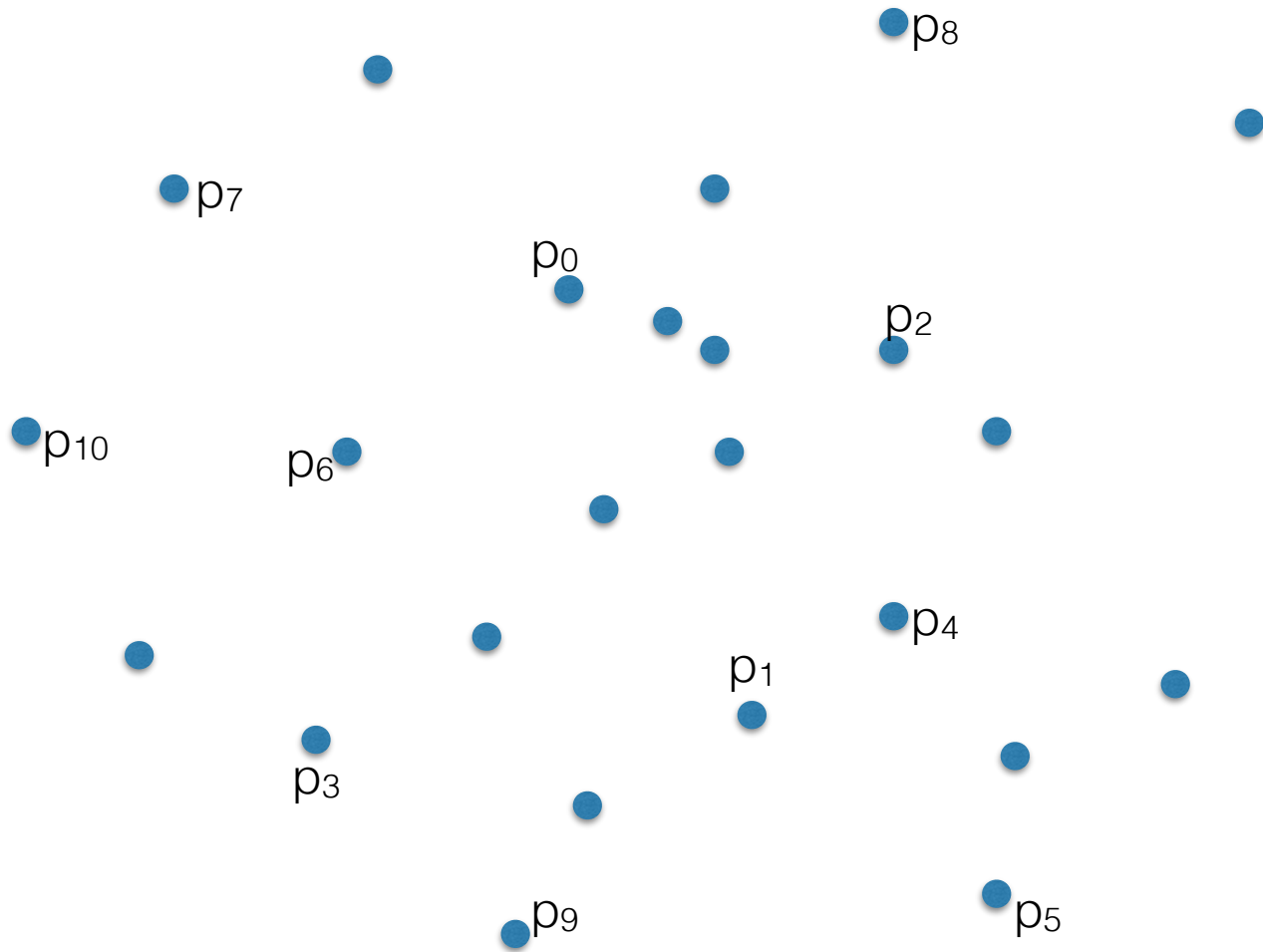
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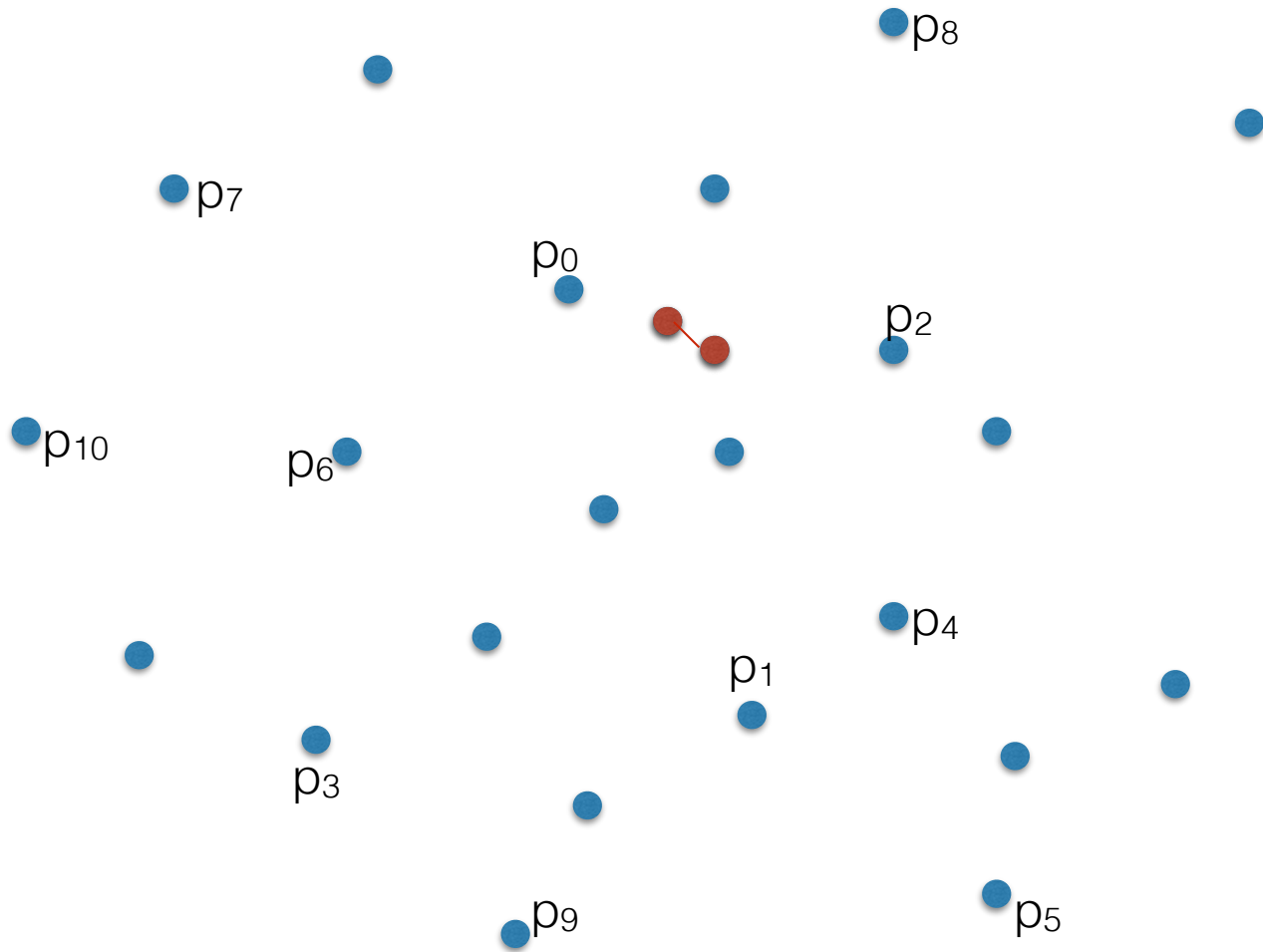


P	p_0	p_1	p_2	p_3	p_4	p_5	

The distance between two points p and q is given by the Euclidian distance given by the formula:

$$d(p,q) = \sqrt{(x_p - x_q)^2 + (y_p - y_q)^2}$$

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Brute force:

- mindist = VERY_LARGE_VALUE
- for all distinct pairs of points p_i, p_j
 - $d = \text{distance}(p_i, p_j)$
 - if ($d < \text{mindist}$): mindist=d
- Analysis:
 - $O(n^2)$ pairs $\implies O(n^2)$ time

A red speech bubble with a tail pointing towards the bottom left, containing the text "Can we do better than $O(n^2)$?" in a dark red font.

Can we do better than $O(n^2)$?