Geometric Intersection

Interval Intersection Detection

- Algorithm

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❖ Task: Given n intervals on the line,
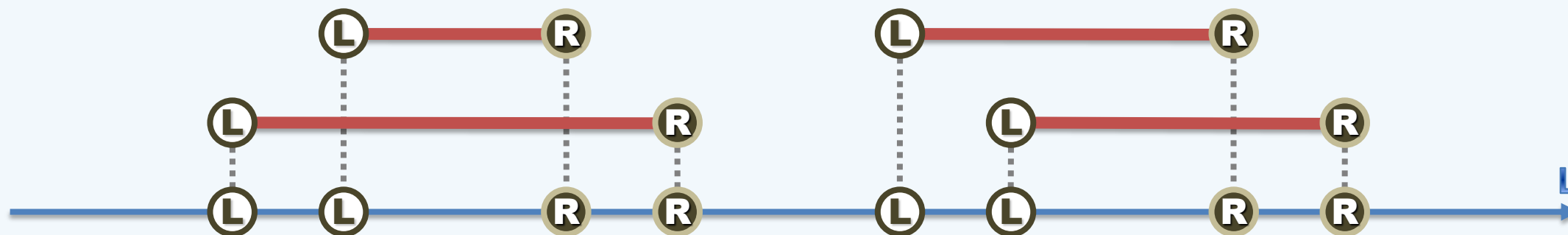
   detect possible intersection among them

❖ Brute-force: test every possible pair of intervals

❖ This requires $\Theta(n^2)$ time since there are altogether $\binom{n}{2}$ candidates
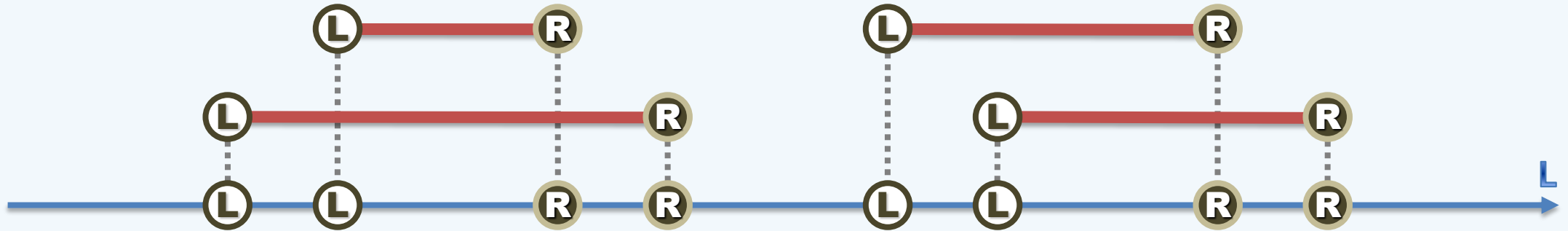
❖ Any faster algorithm for IID?

Algorithm

❖ Color the n left/right endpoints L/R   //O(n)

Sort all the 2n endpoints into a sequence S   //O(nlogn)

Scan S & check each pair of consecutive endpoints   //O(n)

❖ **Two intervals intersect**

    iff

there exists an LL or RR pattern

❖ **There is no intersection among all the intervals**

    iff

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