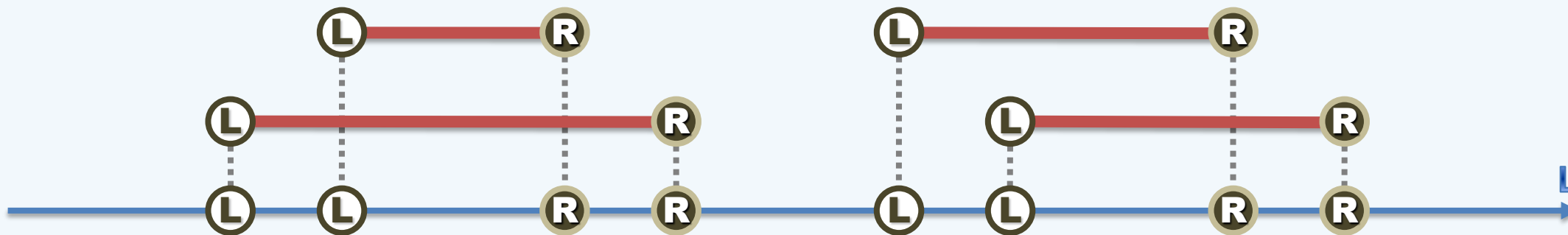# Geometric Intersection

Interval Intersection Detection

- Lower Bound

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❖ We just saw that IID can be solved in $\mathcal{O}$(nlogn) time

❖ Can it be done faster?
  If yes, how? Or, if no, why?

❖ Claim: IID requires $\boxed{\Omega(\text{nlogn})}$ time in the worst cases

❖ Convince yourself by a $\boxed{\text{reduction}}$ from ...

$$\boxed{I\,EU} \quad \leq_N \quad IID \quad \Omega(n\log n)$$

$$x \longrightarrow [x,\ x+0.5]$$

$$\frac{1}{2}$$