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Windowing Query

Segment Tree

- General Windowing Query

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Windowing Non-orthogonal Segments

❖ Input:

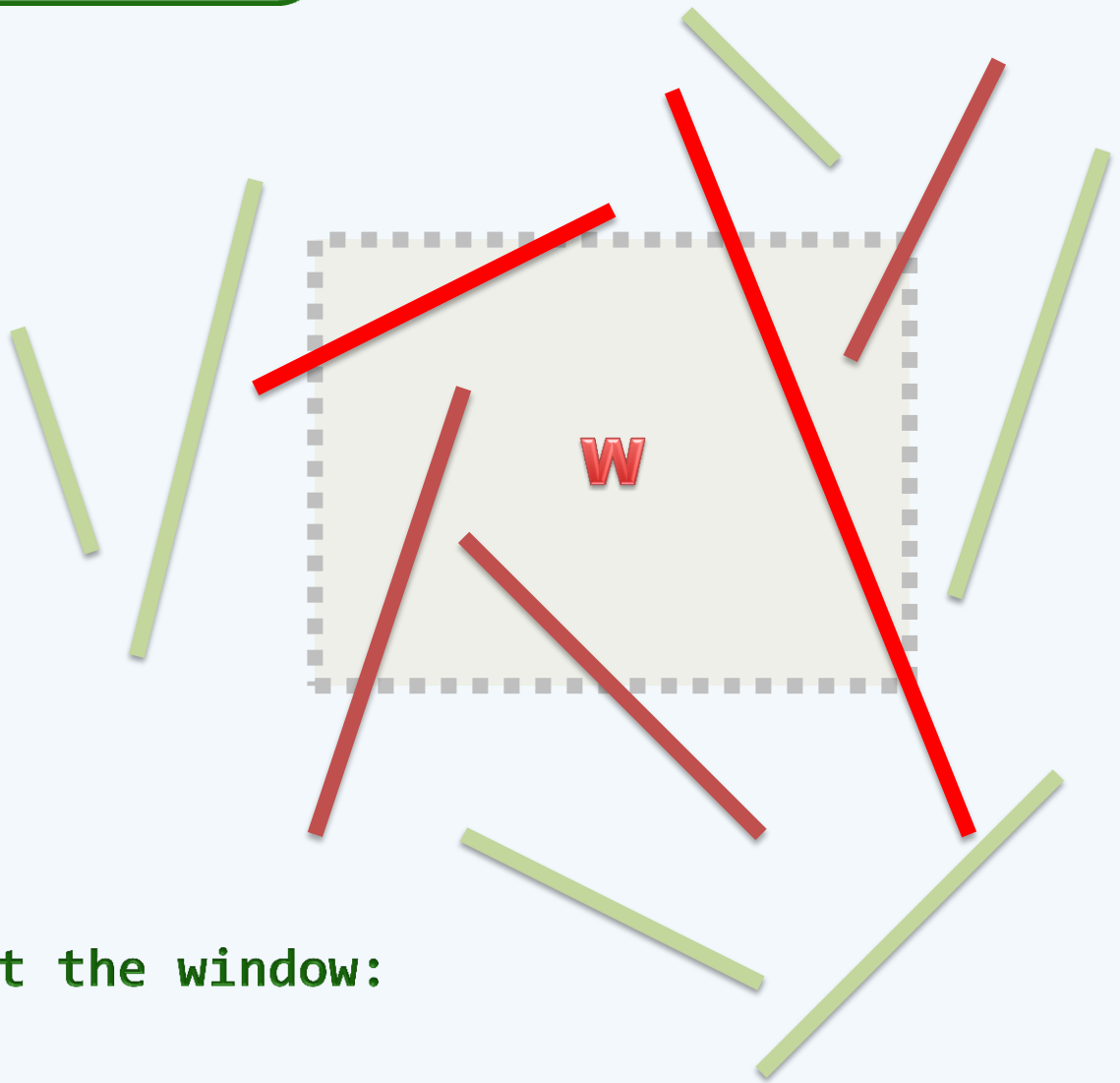
- a set of **disjoint** segments

  in general position:

  $S = \{ s_i \mid 1 \le i \le n \}$

- a closed query **window**:

  $W = [x, x'] \times [y, y']$



❖ Output:

- all line segments that intersect the window:

  $S \cap W = \{ s_i \mid s_i \cap W \neq \varnothing \}$

Type A

❖ Again, the output segments can be divided into 2 types

❖ Segments with at least one endpoint in W

can be reported

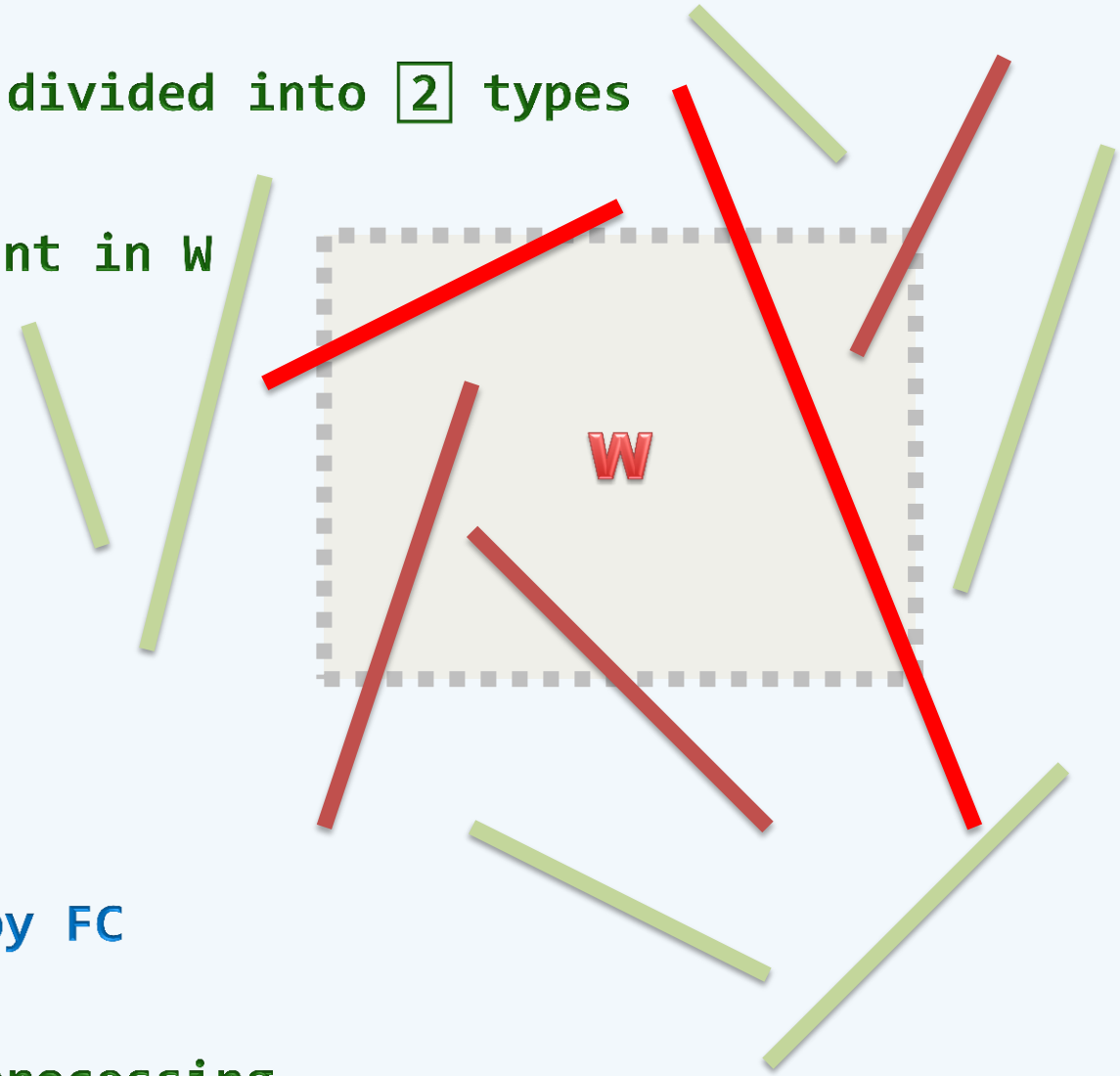
- using a 2D range tree

of size $O(n \log n)$

- in $O(r + \log^2 n)$ time

//improved to $O(r + \log n)$ by FC

- after an $O(n \log n)$ time preprocessing



Type B

- "interval tree + range trees" doesn't help finding all those segments **spanning W** //That's why we turn to **segment trees** ...