

Geometric Range Search

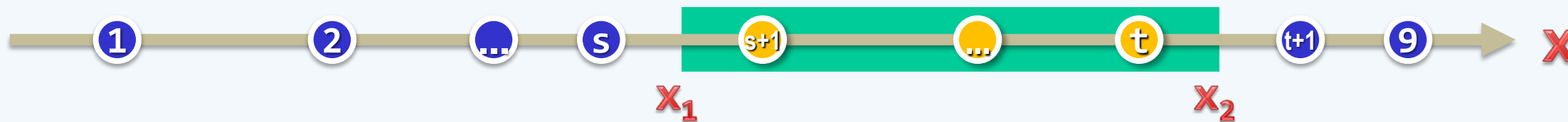
Range Query

- Binary Search

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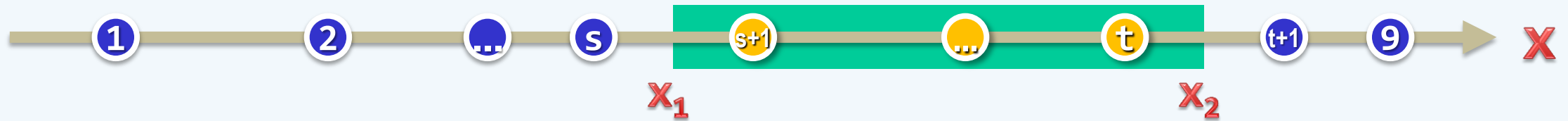
Preprocessing



❖ **Sort** all points into a sorted vector and

add an extra stencil point $p[0] = -\infty$

Binary Search



❖ For any interval $I = (x_1, x_2]$

- Find $t = \text{search}(x_2) = \max\{ i \mid p[i] \leq x_2 \}$ *// $O(\log n)$*

- Traverse the vector `backward` from $p[t]$ and report each point *// $O(r)$*

until escaping from I at point $p[s]$

- return $r = t - s$ *// output size*