Point Location

Performance Of Trapezoidal Map

- Number Of Rays Trimmed

06-J-03

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$k(i) = K(i) + 4$

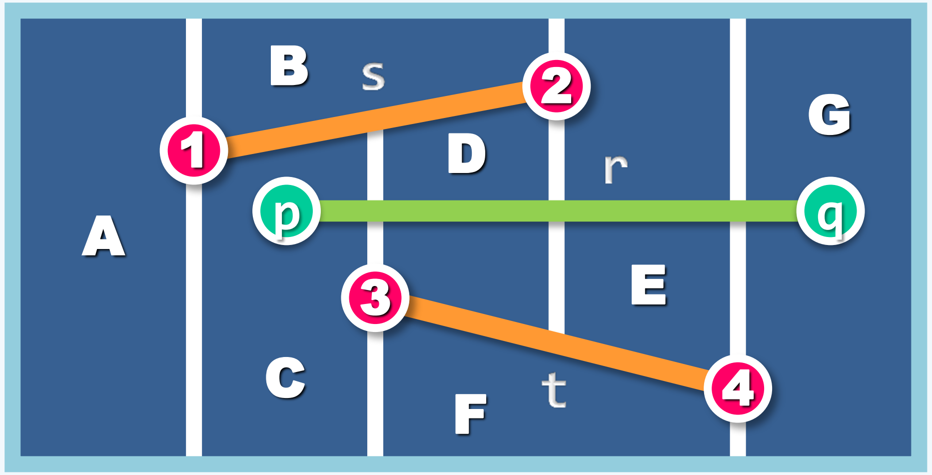
- The insertion of s_i causes $\boxed{K(i)}$ existing rays to be trimmed, and besides, either endpoint of s_i shoots $\boxed{2}$ rays
- To insert s_i, we need to process

  altogether $\boxed{K(i) + 4}$ rays,

  each of which create

  $\boxed{\text{exactly } 1}$ new trapezoid

  in $\boxed{\mathcal{O}(1)}$ time (with DCEL)



- In our example,

  $\boxed{3}$ rays are trimmed and $\boxed{3 + 4 = 7}$ trapezoids created

k(i) = K(i) + 4

❖ Therefore,

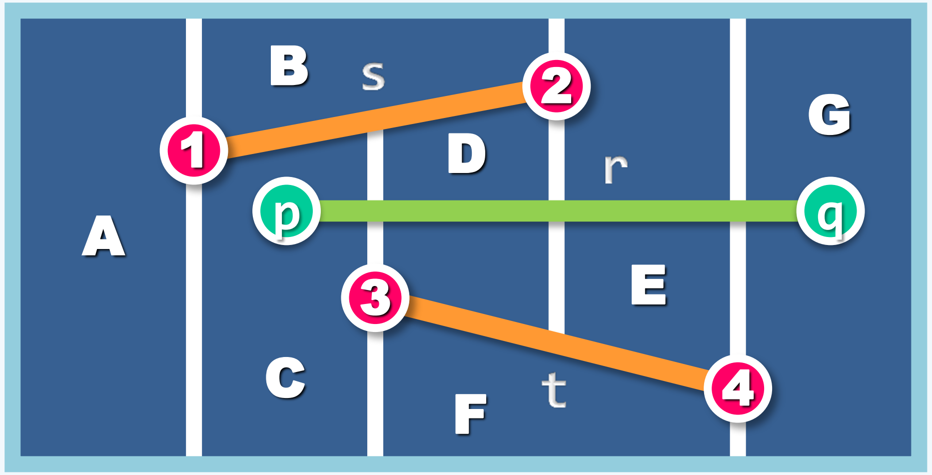
- if the time for $\boxed{\text{locating}}$ the left endpoint of s_i is ignored,

- the i^{th} insertion needs time of

$$T(i) - t(i)$$

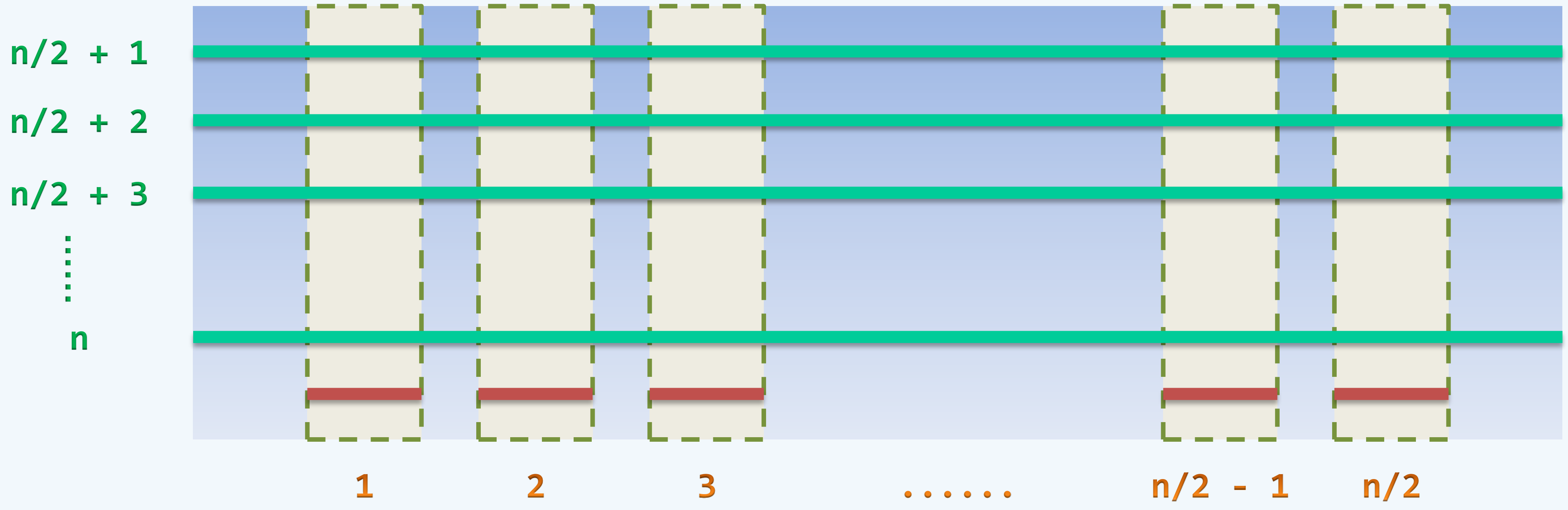
$$= \mathcal{O}(K(i) + 4)$$

$$= \mathcal{O}(k(i))$$



k(i) - Worst Cases

- In the worst case, k(i) can be $\boxed{\Theta(i)}$; and even worse, this can happen for $\boxed{\Theta(n)}$ times; and hence RIC algorithm creates $\boxed{\Theta(n^2)}$ trapezoids totally



k(i) - Expectation

- Surprisingly, however,

  the expectation of $\boxed{k(i)}$ is

  a $\boxed{\text{constant}}$ ...