

Interval Trees

- Store intervals of the form $[l_i, r_i]$, $l_i \leq r_i$.
- Answer queries of the form: which intervals intersect/overlap a given interval $[l, r]$.

Definition

- A binary tree.
- Each node v has a point $v.pt$ and two lists $v.left$ and $v.right$.
- Intervals with $r_i < v.pt$ are stored in the left subtree of v .
- Intervals with $l_i > v.pt$ are stored in the right subtree of v .
- $u.pt < v.pt$ for nodes u in left subtree of v .
- $u.pt > v.pt$ for nodes u in right subtree of v .

Definition

- Intervals with $l_i \leq v.pt \leq r_i$ are stored in **v**.
 - **v.left** has these intervals sorted by l_i .
 - **v.right** has these intervals sorted by r_i .