

# Geometric Range Search

kd-Tree: Structure  
- Canonical Subsets

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- ☞ Each node corresponds to
  - a rectangular sub-region of the plane, as well as
  - the subset of points contained in the sub-region

❖ Each of these subsets is called a **canonical set**

- ☞ For each internal node X with children L and R,  
$$\text{region}(X) = \text{region}(L) \cup \text{region}(R)$$

- ☞ Sub-regions of nodes at a same depth
  - never intersect with each other, and
  - their union covers the entire plane

❖ We will see soon that

each 2D GRS can be answered by the **union** of a number of CS's



## Example

