

Spatial Collection - add following methods to Collection Interface

SpatialCollection(Comparator<? super E>... comparators): Creates a new empty spatial collection, where the provided comparators define the dimensions along which data are compared. Each dimension is assigned an index (0, 1, ...) that is fixed according to the order in which the comparators are provided as parameters to the constructor.

k dim
dim

E max(int dimension): Returns a greatest element in the collection along the given dimension. This method throws a *NoSuchElementException* when the collection is empty. It throws an *IllegalArgumentException* when the given dimension index is not valid for this spatial collection.

0, 1, ..., k-1

E min(int dimension): Returns a least element in the collection along the given dimension. This method throws a *NoSuchElementException* when the collection is empty. It throws an *IllegalArgumentException* when the given dimension index is not valid for this spatial collection.

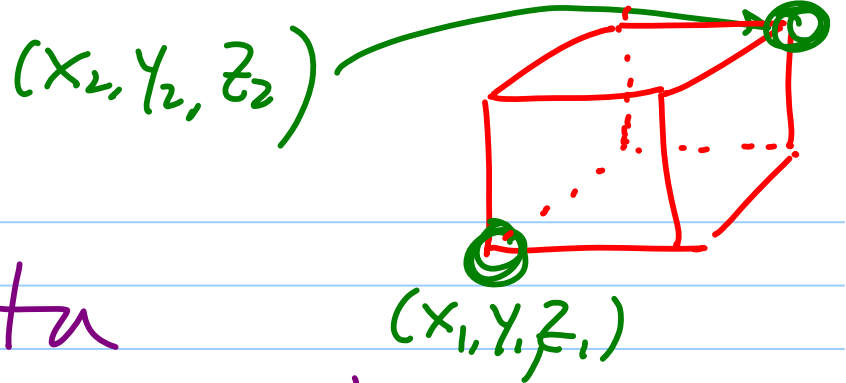
Collection<E> withinBounds(E minCorner, E maxCorner) Returns a collection of the elements that fall within (or on) the boundary of the multidimensional box defined by the two given corners, *minCorner* and *maxCorner*. That is, this method performs an orthogonal range search. It requires that the coordinates of *minCorner* are less than or equal to those of *maxCorner* along every dimension of the spatial collection.

k-dim range query

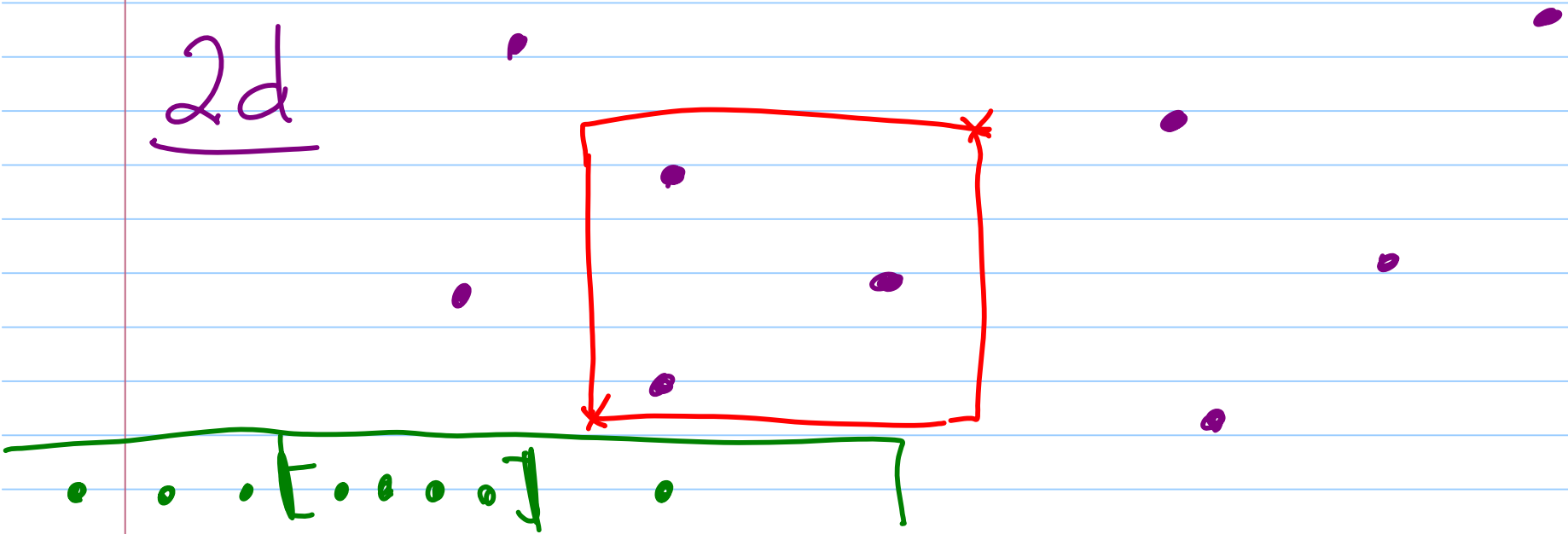


Maintaining
multi-dim data

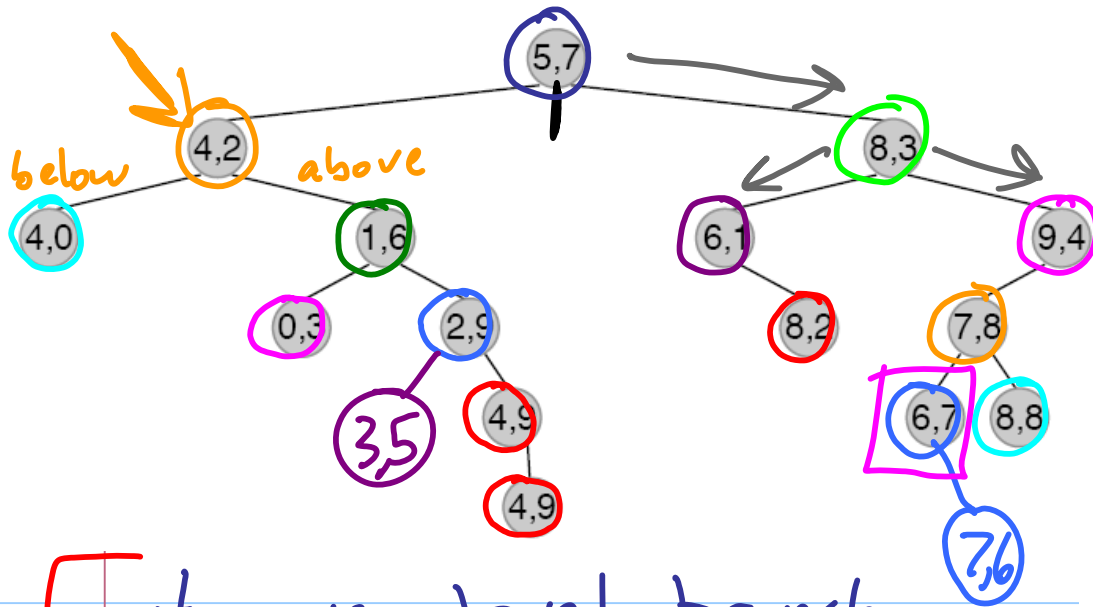
multiple orderings!



2d

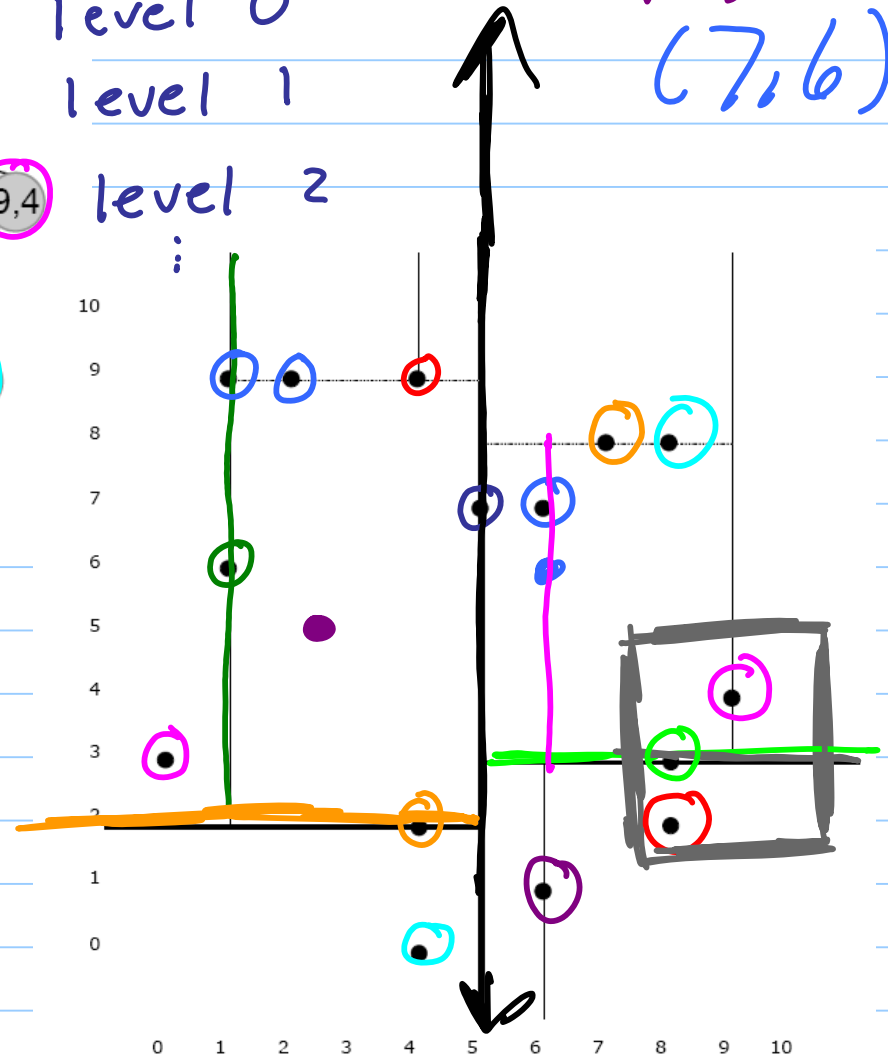


K-d Tree for K (#dim) = 2



level 0
level 1
level 2
⋮

(3,5)
(7,6)



at even level branch
Using x-coord

at odd level branch
Using y-coord