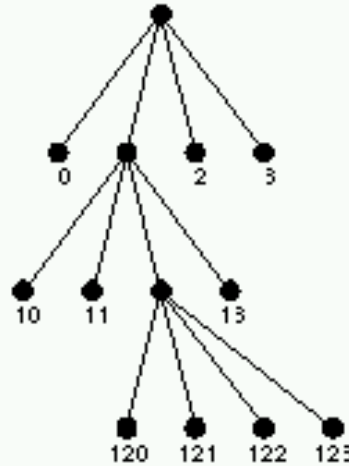
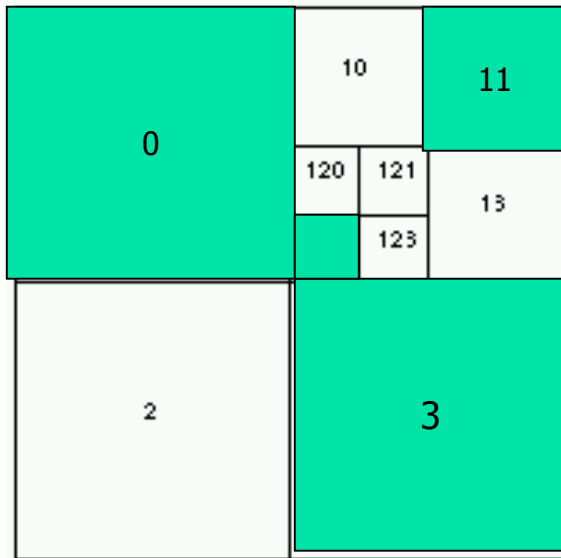




Quadtrees

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QuadTrees



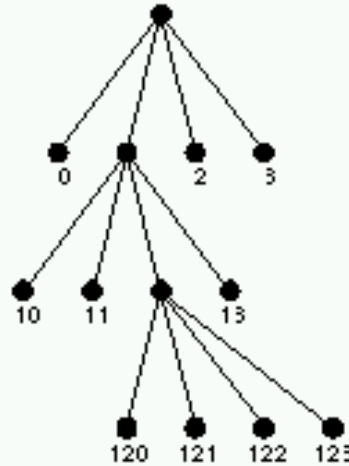
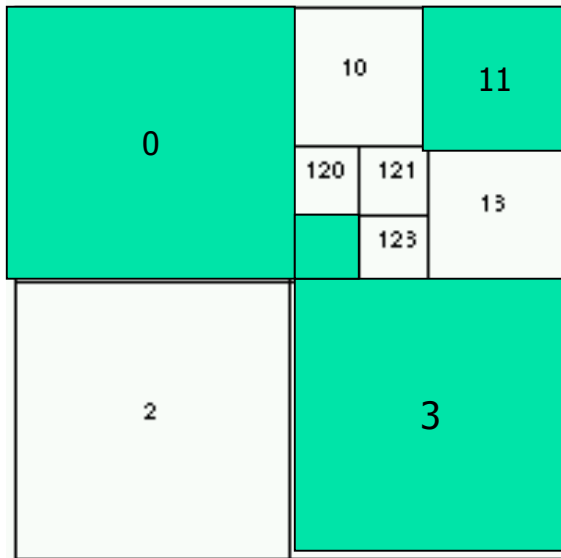
Consider a black/white picture stored on an $2^h \times 2^h$ grid.

We can represent the shape “compactly” using a QT.

Alg constructQT (input – a shape R . Output – a Quadtree corresponding to R).

- If R is fully black, or R is fully white – store as one (leaf) node v .
 - Otherwise, divide the shape into 4 equal-size quadrants NW, NE, SW, SE .
 - Call constructQT recursively for each quadrant.
 - Create an internal node v having 4 children, corresponding to the 4 quadrants.
- Return v .

QuadTrees



Consider a black/white picture stored on an $2^h \times 2^h$ grid.

We can represent the shape “compactly” using a QT.

Height – at most h .

Point location operation – given a point q , is it black or white
– takes time $O(h)$.

Many other operations are very simple to implement.