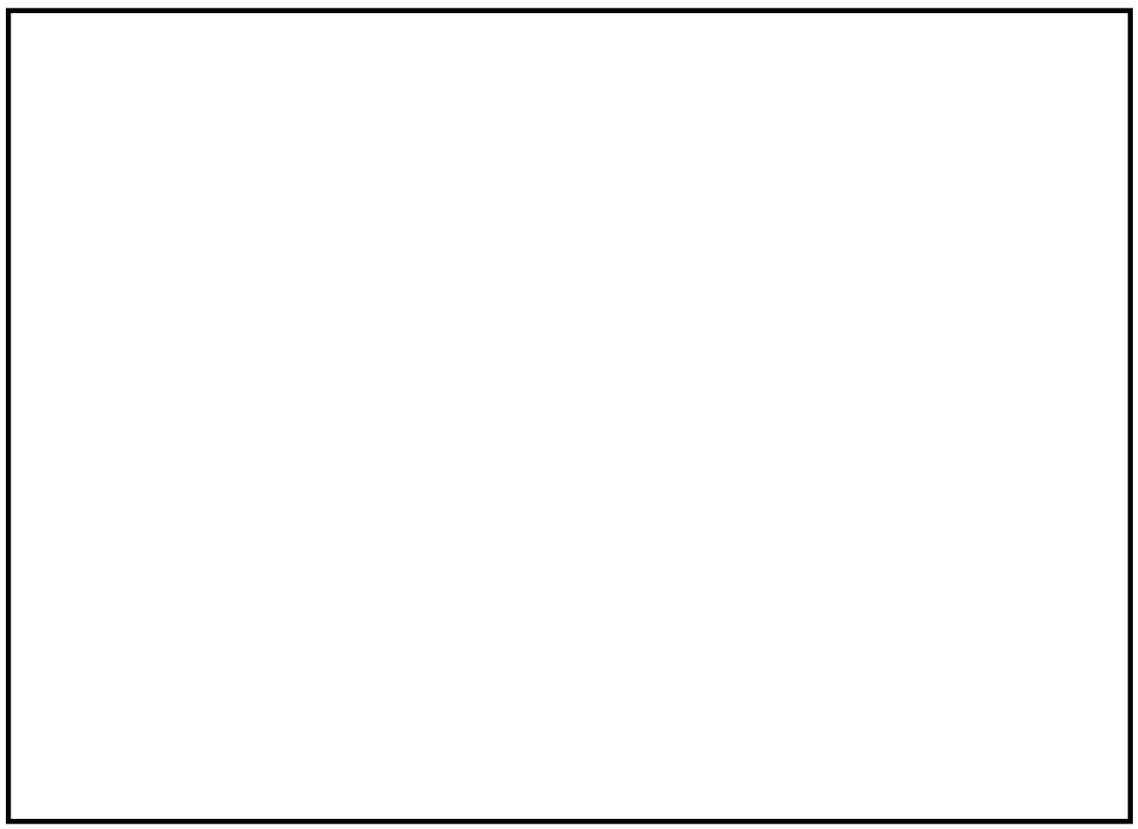
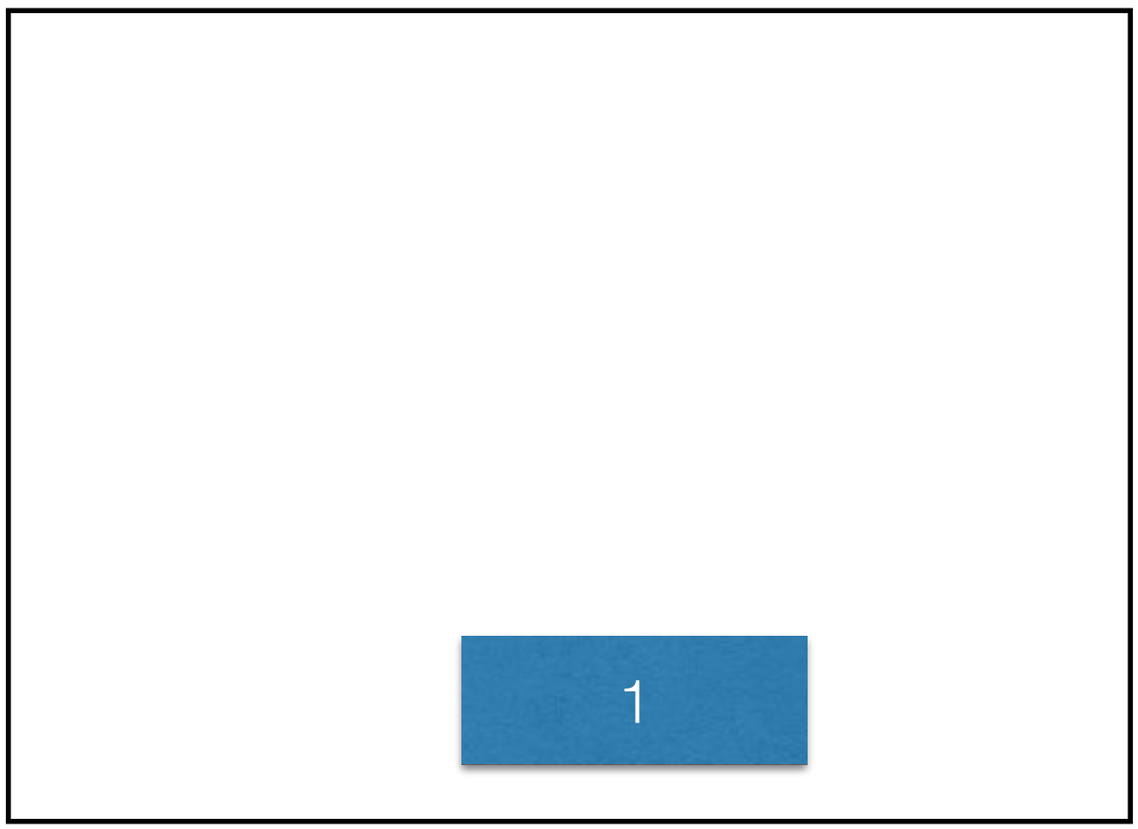
graphical depiction:



tree:

Initially, the root node is empty since no boxes have been added to the region.

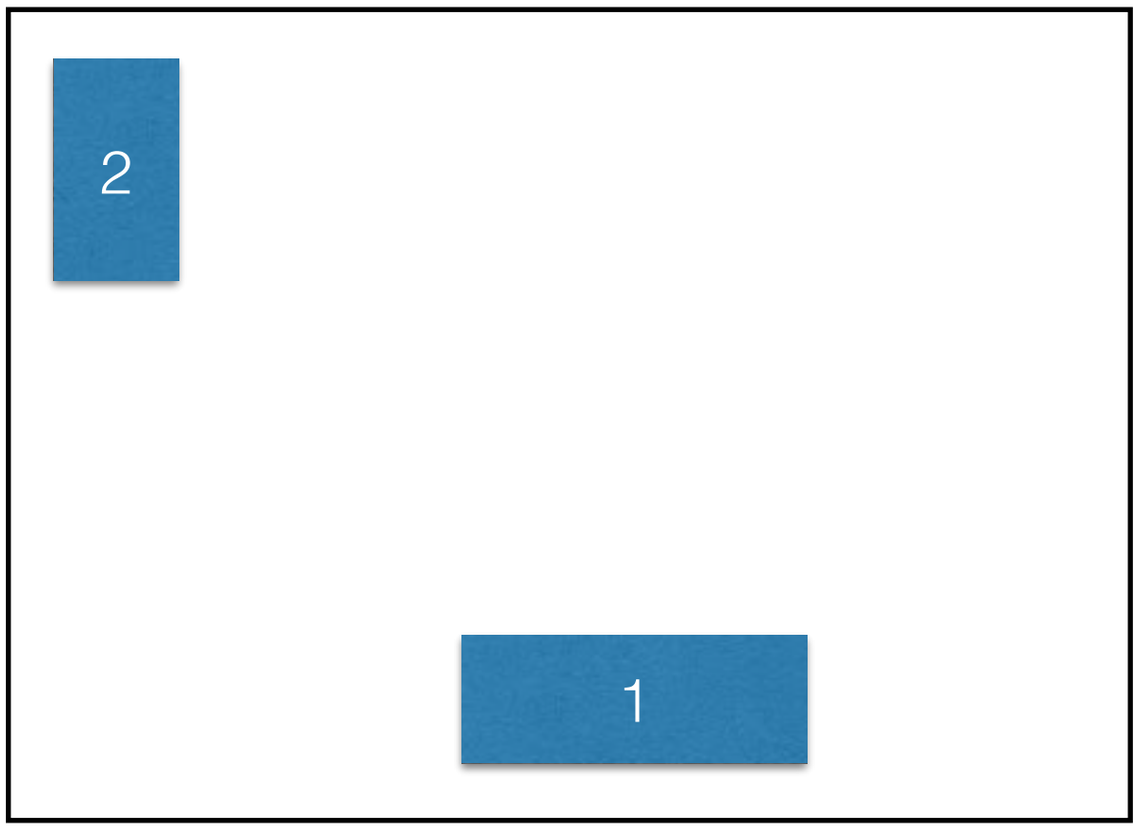
graphical depiction:



tree:

Sprite 1 is added to the root node. Since the root node has only one sprite in it and the MAX_SPRITES is 2, there is no need to split yet.

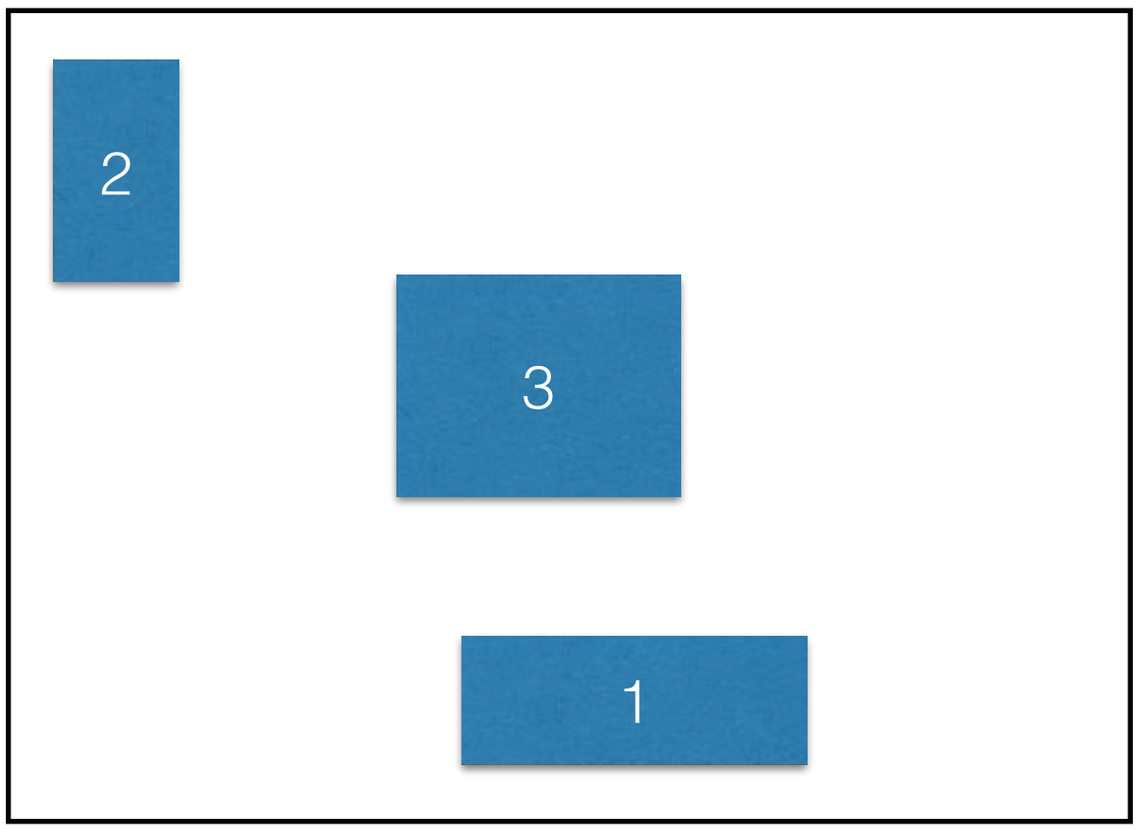
graphical depiction:



tree:

Sprite 2 is also added to the root node—still no need to split.

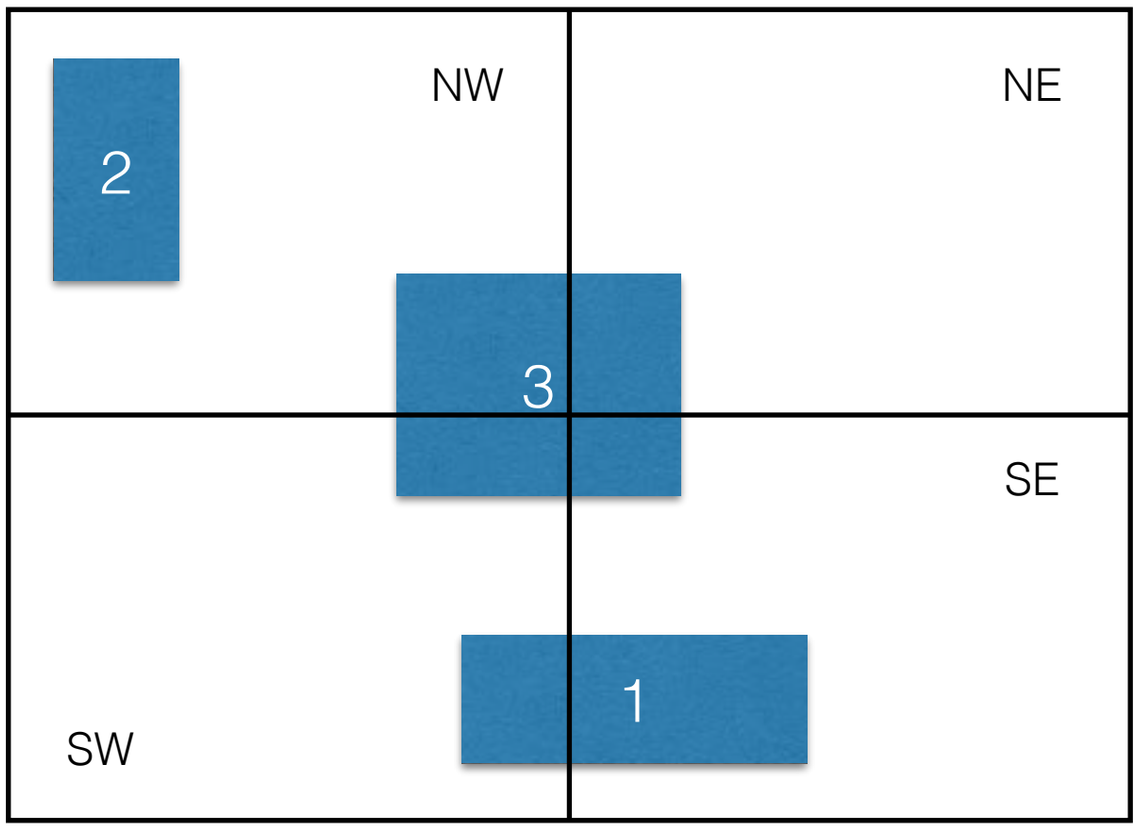
graphical depiction:



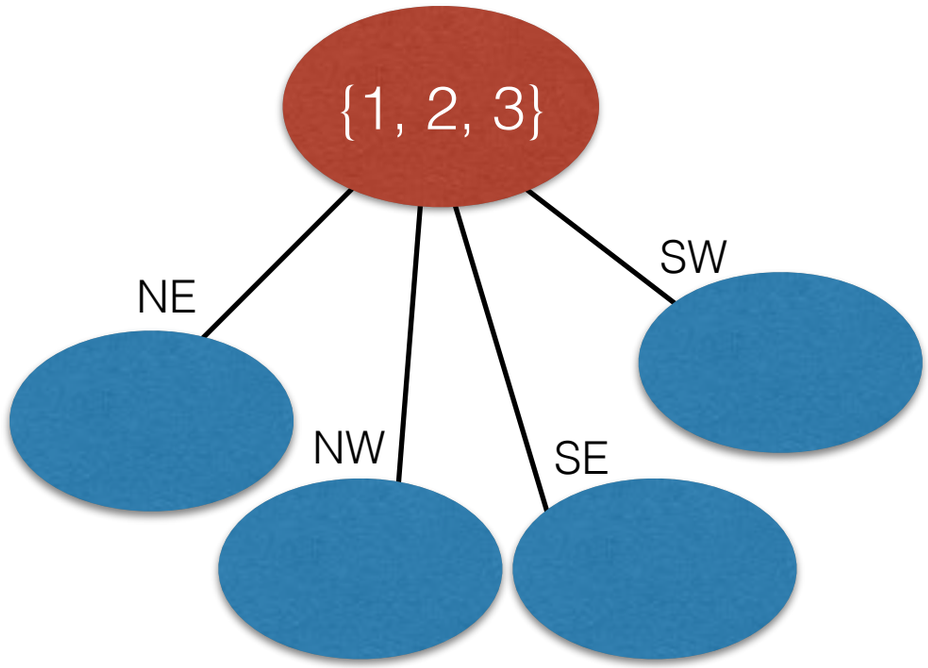
tree:

Sprite 3 is added. Now we have a problem, because there are 3 sprites in the root node, but the MAX_SPRITES is 2. Thus, we need to split the root node.

graphical depiction:

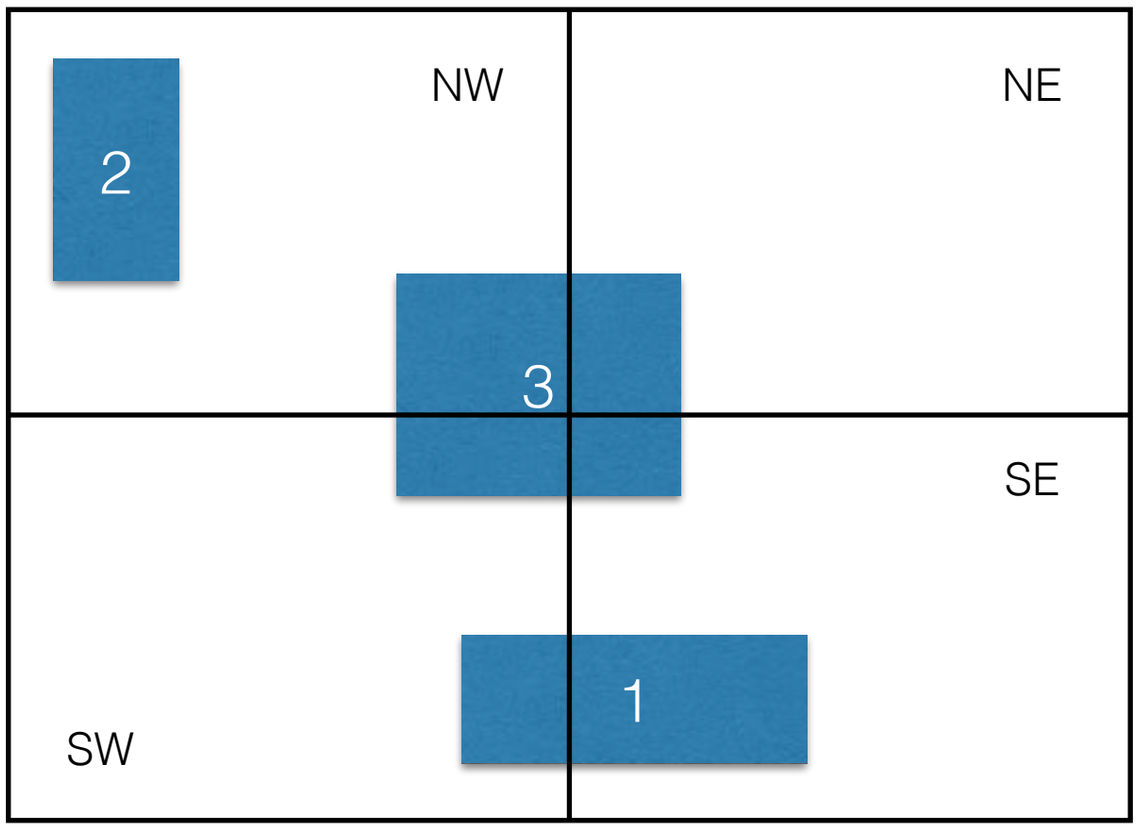


tree:

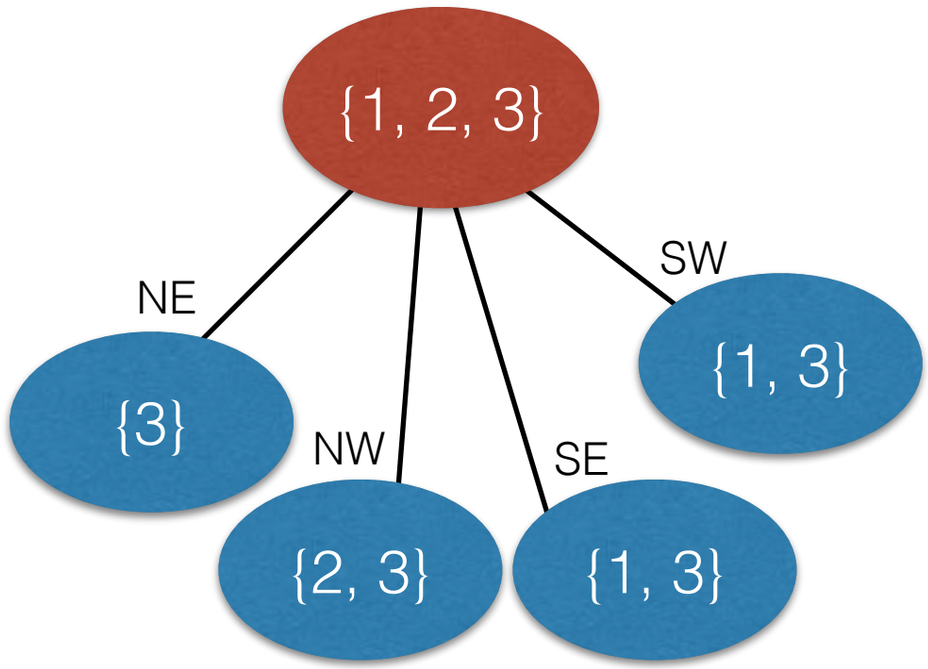


Sprite 3 is added. Now we have a problem, because there are 3 sprites in the root node, but the MAX_SPRITES is 2. Thus, we need to split the root node.
We first create new nodes for the north-east, north-west, south-east, and south-west quadrants.

graphical depiction:

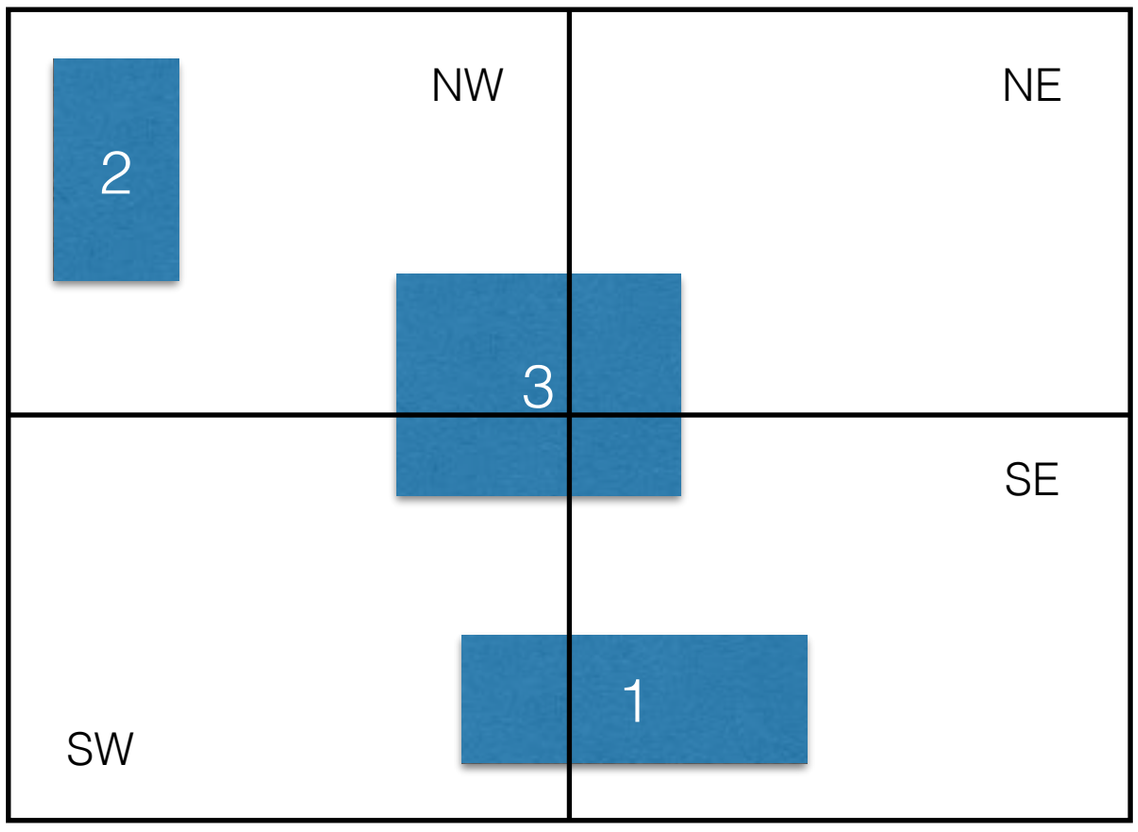


tree:

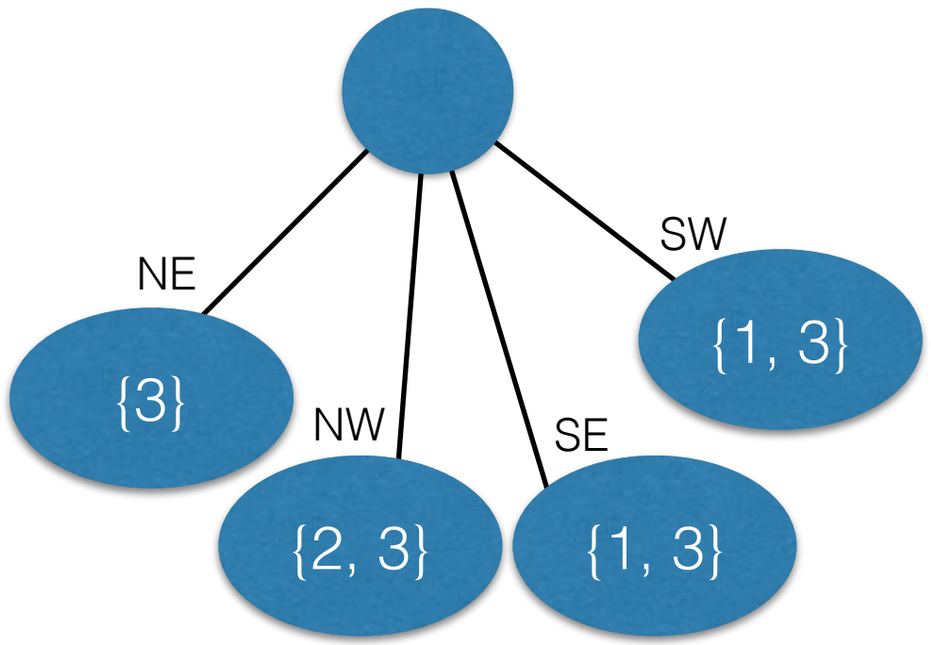


Sprite 3 is added. Now we have a problem, because there are 3 sprites in the root node, but the MAX_SPRITES is 2. Thus, we need to split the root node.
We first create new nodes for the north-east, north-west, south-east, and south-west quadrants.
Next we store each sprite in the nodes that contain it.

graphical depiction:

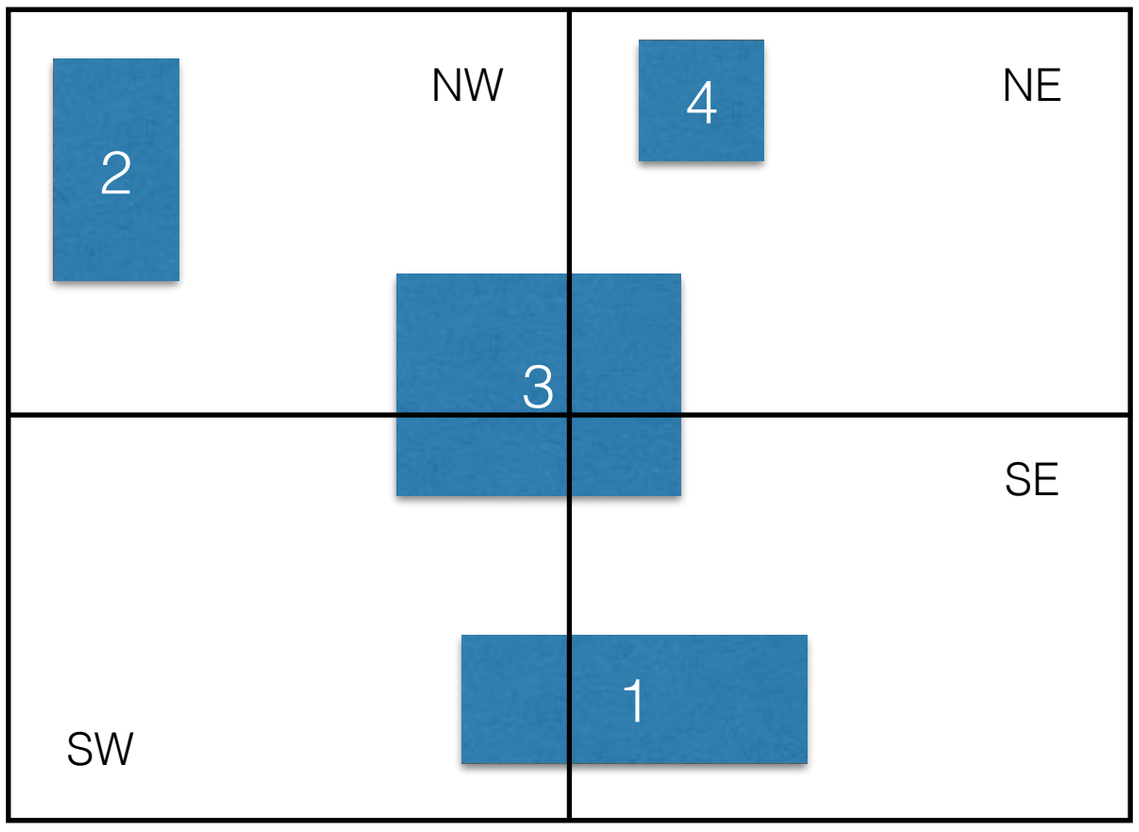


tree:

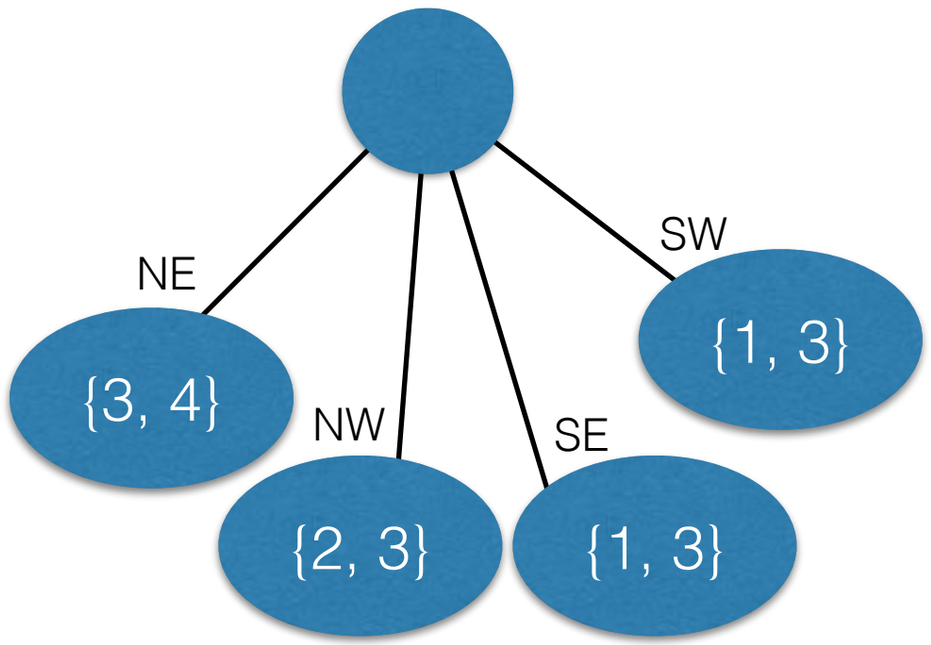


Sprite 3 is added. Now we have a problem, because there are 3 sprites in the root node, but the MAX_SPRITES is 2. Thus, we need to split the root node.
We first create new nodes for the north-east, north-west, south-east, and south-west quadrants.
Next we store each sprite in the nodes that contain it.
Finally, we clear the nodes at the root.
Notice: Sprite 1 overlaps two of the nodes and so is stored twice. Sprite 3 overlaps all four quadrants and so is stored four times.

graphical depiction:

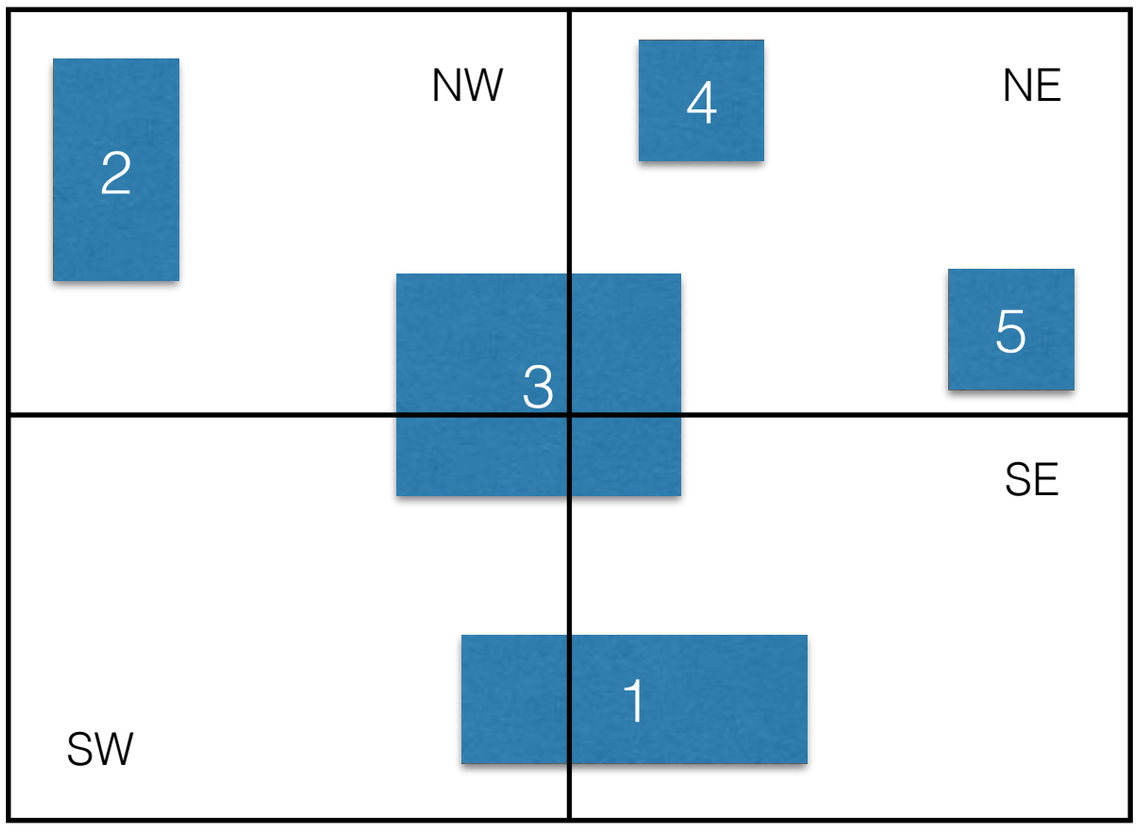


tree:

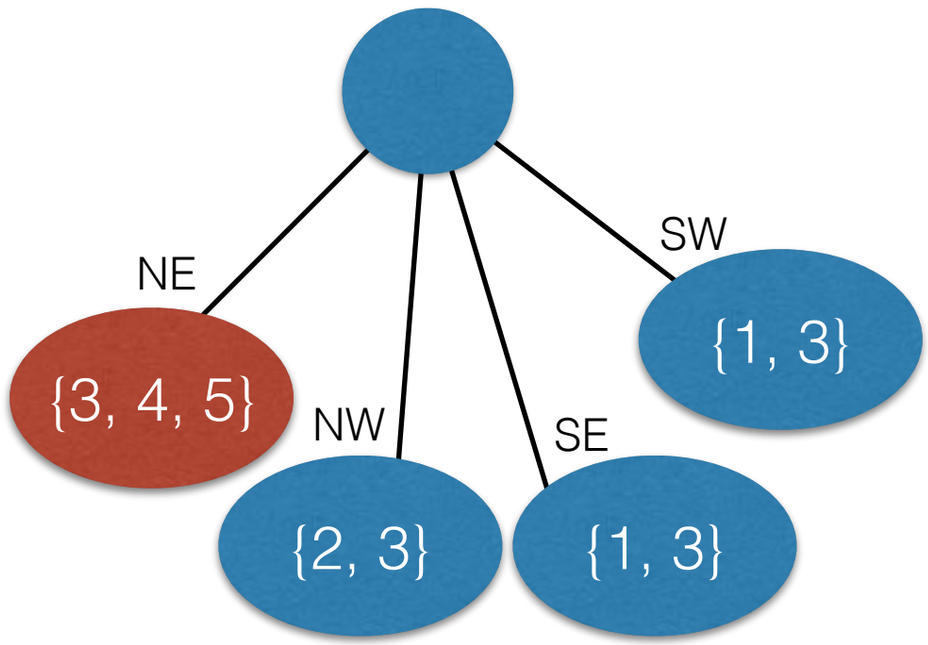


Next, we add sprite 4, which only intersects the NE quadrant.

graphical depiction:

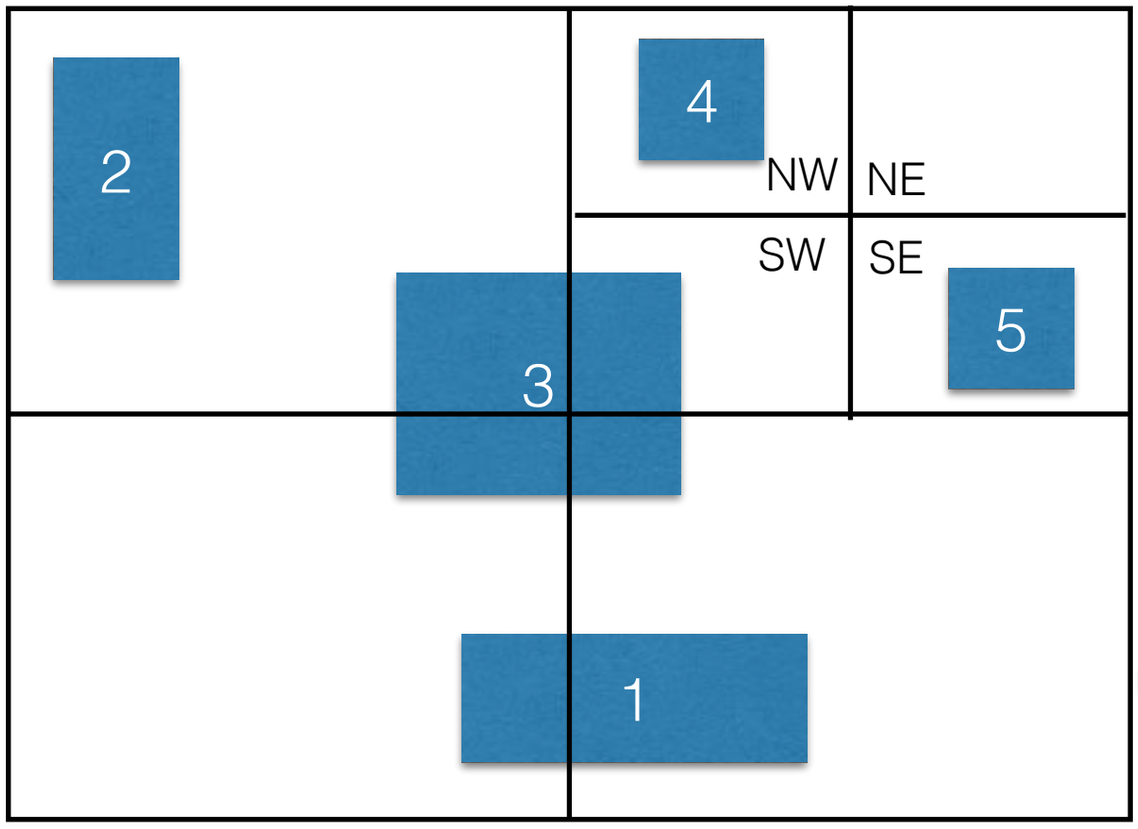


tree:

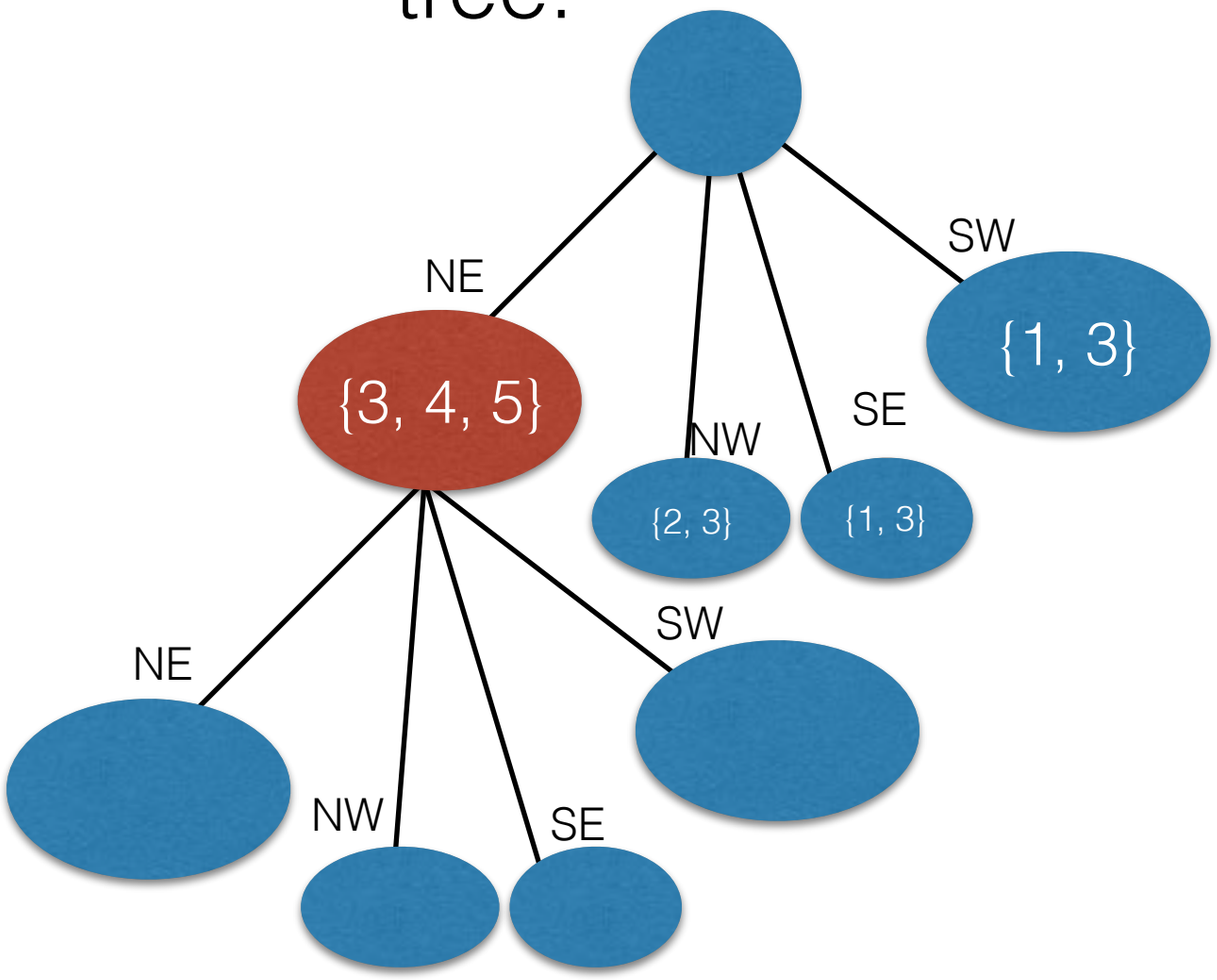


We then add sprite 5. Here again we have a problem, since there are now three items in the NE node. Thus, we need to further divide this node into NE, NW, SE, and SW regions.

graphical depiction:

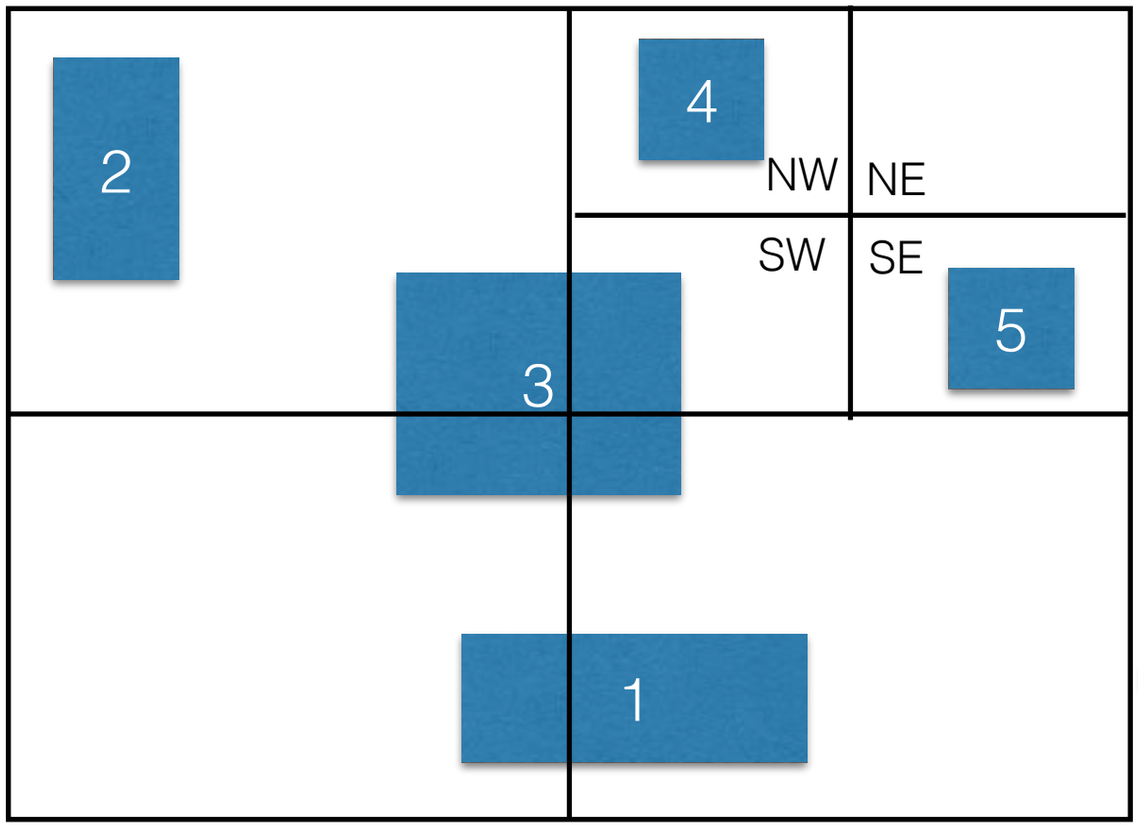


tree:

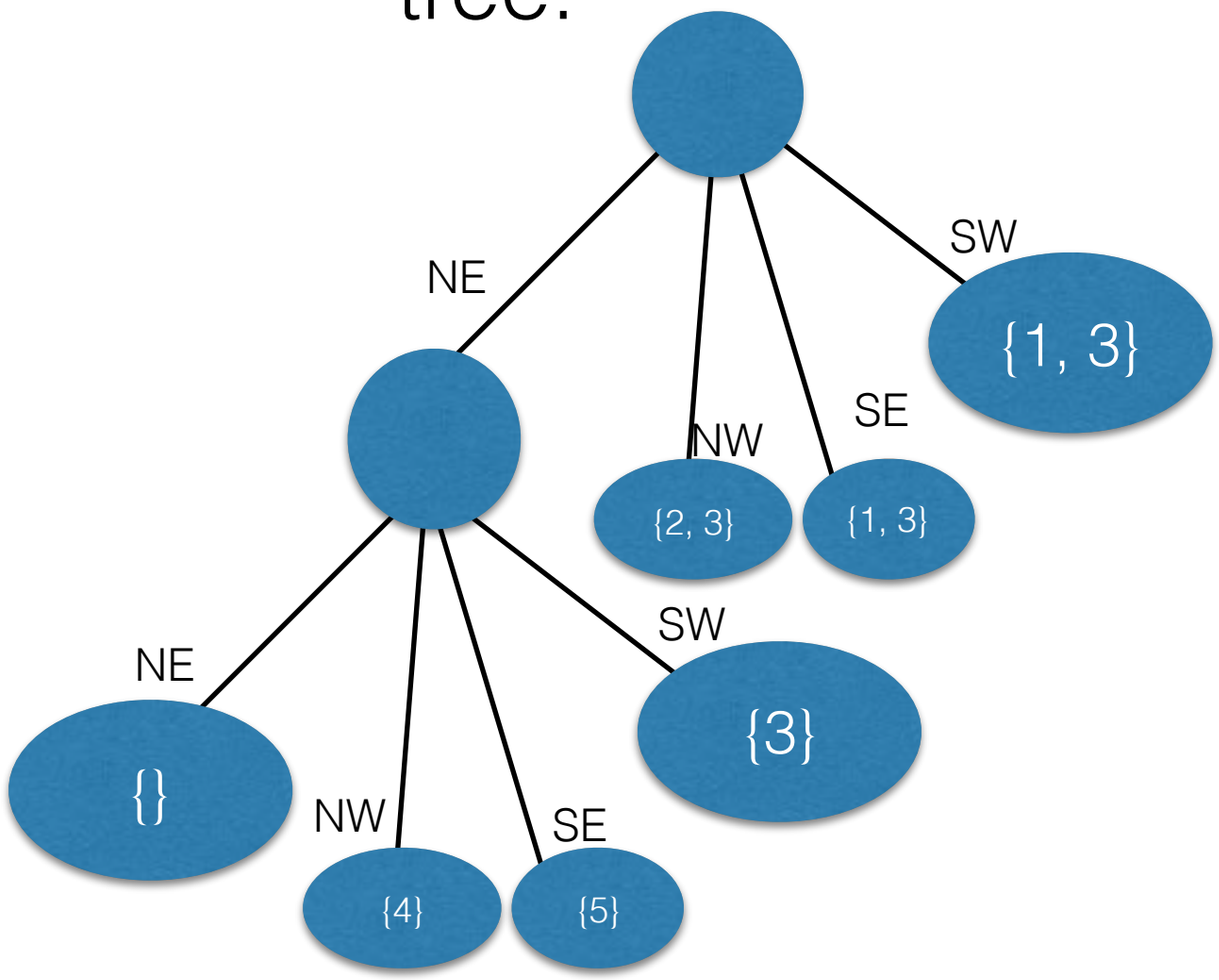


We then add sprite 5. Here again we have a problem, since there are now three items in the NE node. Thus, we need to further divide this node into NE, NW, SE, and SW regions.

graphical depiction:



tree:



We then add sprite 5. Here again we have a problem, since there are now three items in the NE node. Thus, we need to further divide this node into NE, NW, SE, and SW regions.

Again, we push the sprites down from the split nodes to the leaves.