Class work: Range-trees

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1. Show the BBST with points in the leaves for $P = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$.

2. Sketch pseudo-code for building a BBST(P).

```
//P is a set of points
//returns  BBST(P) with points in the leaves
buildBBST(P)
```

3. Analyze the algorithm above and fill in the following result.

   Theorem: Given a set of elements P, a balanced binary search tree for P with data in the leaves can be built in $O($ $)$ time.

4. What if P is sorted? Fill in the following result:

   Theorem: Given a set of elements P *which are sorted*, a balanced binary search tree for P with data in the leaves can be built in $O($ $)$ time.

5. **2d range tree:** Consider the following set of points in the plane:

$$P = \{(1,4),(5,8),(4,1),(7,3),(3,2),(2,6),(8,7)\}$$

   Show the range tree of P.

6. **3d range tree:** Draw the 3d-range tree for the set of points below.