1. Consider the following hash functions $h_1(k) = k \mod 7$ and $h_2(k) = k \mod 5$. Insert the following entries into a hash table of size 6 using cuckoo hashing: 3, 10, 14, 12, 19.

2. Build a quadtree over the plane $[0, 8] \times [0, 8]$ using the following points: (1, 4), (2, 6), (3, 2), (4, 8), (7, 3), (6, 1), (5, 7), (3, 8).

3. Build a kd-tree using the following points: (1, 4), (2, 6), (3, 2), (4, 8), (7, 3), (6, 1), (5, 7), (3, 8).

4. Consider the following variant of two-dimensional range reporting queries. We keep a set of two-dimensional points $P$ in a data structure. All points have positive coordinates. For a query range $Q = [a, b] \times [0, c]$, we must find some point $p \in P \cap Q$ or report NULL if the intersection is empty. In other words, we must find one point $p$ such that $p.y \leq c$ and $a \leq p.x \leq b$ (we do not need all of them; only one!) Describe a data structure that answers queries described above in $O(\log(n))$ time and uses space $O(n)$. 
