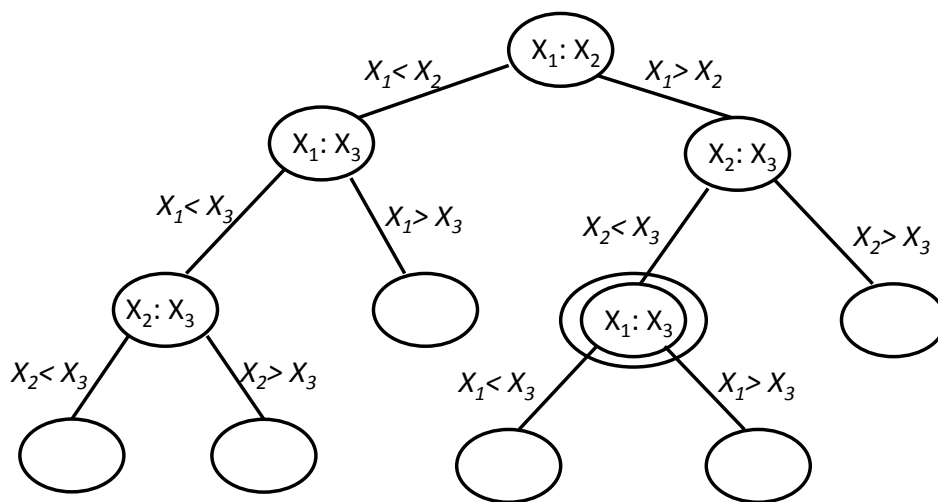


Quiz 8

Instructor: Sandy Irani

1. Consider the comparison tree given below which corresponds to a comparison-based algorithm that sorts three items: x_1, x_2, x_3 . Each internal node is labeled with a comparison and the edges leading to its children are labeled with the outcome of that comparison. For the purposes of this problem, you can assume that no two items are equal. Based on the values of the items to be sorted, the correct output of the algorithm will be one of the six possible orderings or permutations of the items. Consider the node below with the double edge around it. What ordering(s) of x_1, x_2, x_3 will cause the algorithm to reach that node in the tree?



2. Suppose that we use Radix Sort to sort the following pairs:

$(3, 4), (1, 5), (2, 0), (3, 3), (4, 5), (1, 1), (1, 4), (2, 4), (0, 6)$

Show what order the pairs are in after the first iteration of Radix sort (after Bucket Sort is called once).