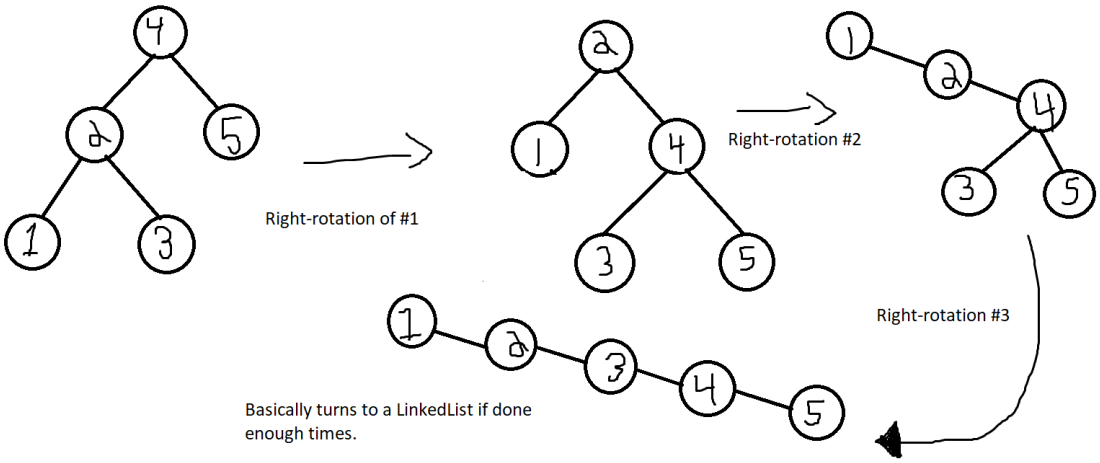
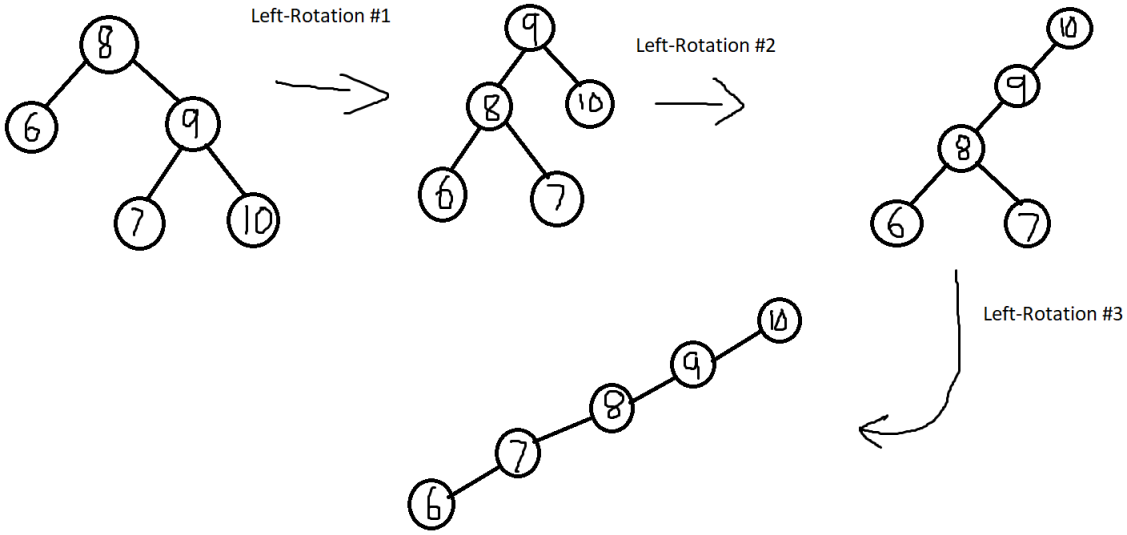
Exercise 3.3.38: Fundamental theorem of rotations. Show that any BST can be transformed into any other BST on the same set of keys by a sequence of left and right rotations.

Solution:

- Recall that BSTs with rotation allow for the shifting of nodes.
- By doing these rotations a certain number of times, we can effectively change the shape of BSTs to the one of our own choice.
- For example, if repeated rotations occur, eventually certain sides of the tree and subtrees become null and we end up getting a LinkedList shown below.



Same idea for left-rotations:



So by showcasing how a BST can be converted to a single LinkedList, this clearly proves that we can create any BST with same set of keys by the sequence.