![A picture containing map

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Problem statement:

After construction return root after constructing.

![A picture containing text, blackboard

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1st is valid BST but the 2nd is not valid as 9 there which is greater than 8.

![A screenshot of a video game

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For this just do normal BSt insertion. But this approach takes O(n^2) times.

Another example:

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Same method brute would be just naively creating bst.we would just normally insert in BST.

O(n^2) is time complexity.

![A picture containing scissors

Description automatically generated]() for this time complexity O(n^2).

2nd method will be:

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Just sort the given preorder and make binary tree from it this will give the bst.

As bst property in in order is sorted for in order.

![A picture containing text, clipart

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Time complexity is nlogn for sorting and to create is n

Hence TC is O(nlogn)

Space would be n too.

For optimal we can just![Text

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Here we will take upper bound=INT\_MAX. hence is 8 inside the upper bound yes.

Here 5 1 7 are lesser than 8 and we can these are part of left subtree.

Now upper bound is 8 and 5 is in the range and hence 5 is new root.

When go to left will be new upper bound but in the the right will be earlier upper bound.

![Text

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Left new node is upper bound and in right prev is upper bound.

Time complexity is O(3n)

Diagram, schematic

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Worst case visiting node is 3 times.

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