

**Akhil**

Posted on ٦ أبريل ٢٠٢٠

Converting a sorted array to binary search tree in Javascript

#javascript #algorithms #interview #career

Question: given a sorted array, convert it to a binary search tree.

Let's start by understanding what's a binary search tree is?

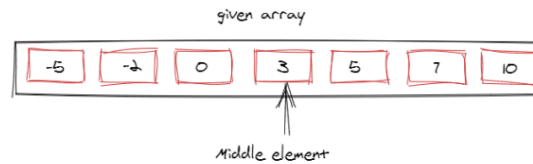
Binary Search Tree

A binary search tree is a type of tree in which at any root, the elements in it's left subtree are strictly decreasing and elements in it's right subtree are strictly increasing.

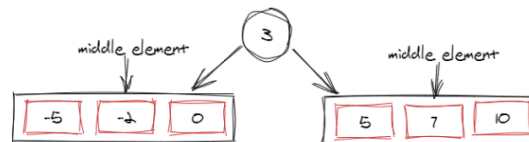
So we've to figure out a way to choose elements from array such that the binary search tree constraints are followed.

This leads to an intuition of picking element at the middle index of a subarray.

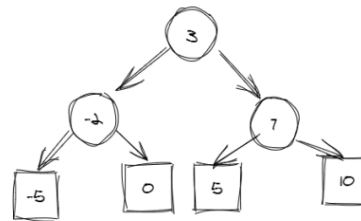
Let's understand this:



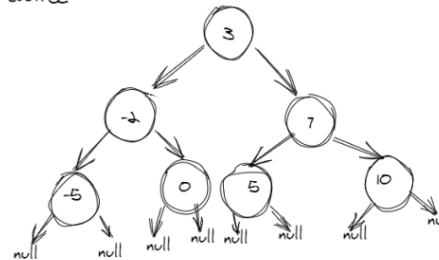
Based on middle element, divide the entire array into two subarrays, the left subarray contains elements less than middle element which will form our left subtree similarly right subtree contains elements greater than middle element which will form our right subtree



Now we follow the same steps of finding middle index of respective subarrays, and creating new subtrees out of it.



When you reach a point where there are no leftsubtree possible, mark that node as null, similar for right subtree



so based on this let's write our solution:

```
var sortedArrayToBST = function(nums) {
  return traverse(nums,0,nums.length-1); // recursively parse through array
};
```

```
function traverse(nums,start,end){
  if(start>end){                                // if start>end means left tree or right subtree is not possi
    return null;
  }
  let mid = Math.floor((start+end)/2);          // get the mid index
  let root = new TreeNode(nums[mid]);           // make a new node
  root.left = traverse(nums,start,mid-1);        // now recursively generate left subtree
  root.right = traverse(nums,mid+1,end);         // similarly generate right subtree
  return root;                                  // return the root
}
```

That's it !

github: <https://github.com/AKHILP96/Data-Structures-and-Algorithms/blob/master/problems/convertSortedArrayToBST.js>

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Akhil

Hi, I am Akhil. I write about Design, Tech, and algorithms.

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