Explanations

Algorithm

if(start>end){

return -1;

}

int mid=start+((end-start)/2);

if(arr[start]<x){

if(x<arr[mid]){

return binarySearch(arr, start,mid-1, x);

}else if(x>arr[mid]){

if(arr[mid]<arr[start]){

return binarySearch(arr,start, mid-1, x);

}else{

return binarySearch(arr, mid+1, end, x);

}

}else{

return mid;

}

}else if(arr[start]>x){

if(x>arr[mid]){

return binarySearch(arr,mid+1,end,x);

}else if(x<arr[mid]){

if(arr[mid]>arr[start]){

return binarySearch(arr, mid+1,end,x);

}else{

return binarySearch(arr, start,mid-1,x);

}

}else{

return mid;

}

}else{

return start;

}

In this algorithm, every time it comes to the comparison half of the array elements will ignore. Therefore I can say this is just a binary search algorithm . And other words this is an optimized binary search algorithm for which is improved using given properties and what question says to do. As I said above every time it comes to the comparison half of the array elements will ignore, therefore,

