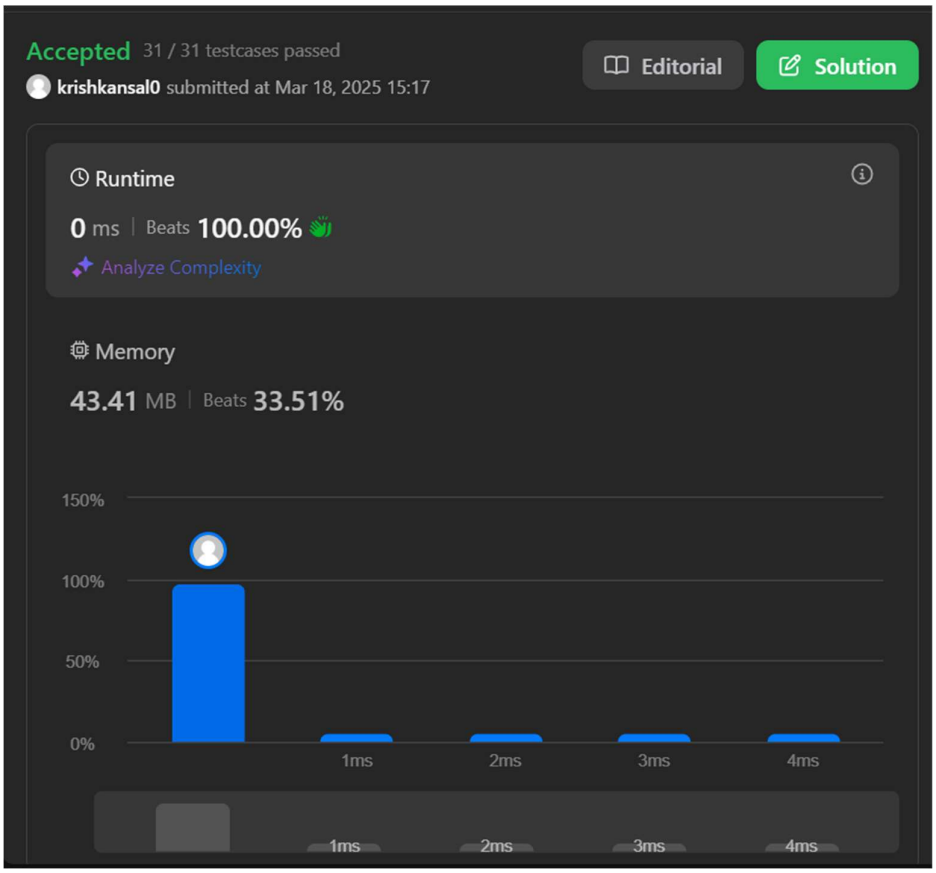
Krish Aggarwal 22BCS16370 IOT-FL-603

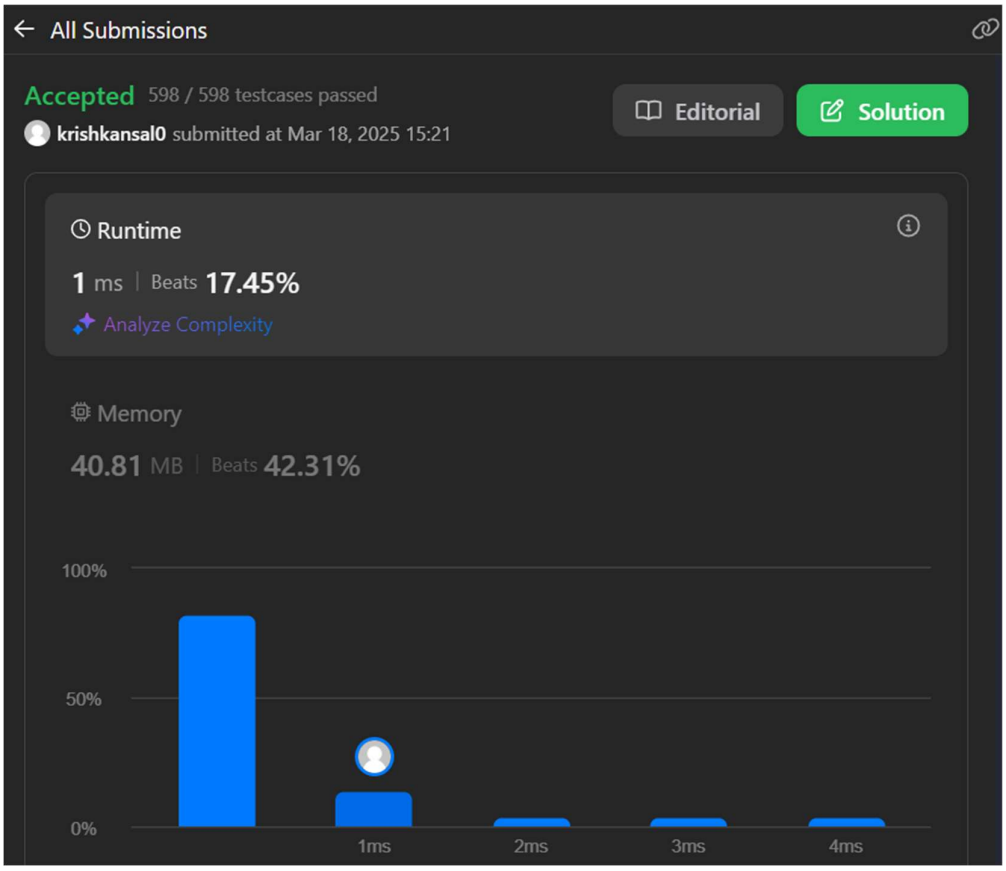
108.Convert Sorted Array to Binary Search Tree

```java
class Solution {
    public TreeNode sortedArrayToBST(int[] nums) {
        return buildBST(nums, 0, nums.length - 1);
    }

    private TreeNode buildBST(int[] nums, int left, int right) {
        if (left > right) return null;
        int mid = left + (right - left) / 2;
        TreeNode root = new TreeNode(nums[mid]);
        root.left = buildBST(nums, left, mid - 1);
        root.right = buildBST(nums, mid + 1, right);
        return root;
    }
}
```



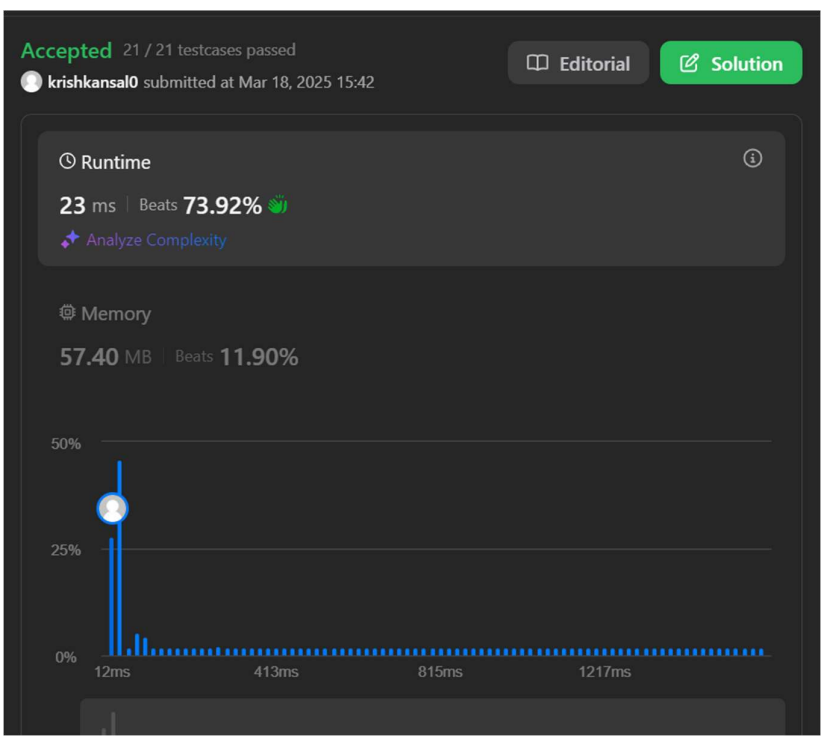
191.Number of 1 Bits

```java
class Solution {
    public int hammingWeight(int n) {
        ArrayList<Integer> arr=new ArrayList<>();
        int i=0;
        while(n >0){
            int x=n%2;
            arr.add(x);
            if(x==1){
                i++;
            }
            n=n/2;
        }
        return i;
    }
}
```



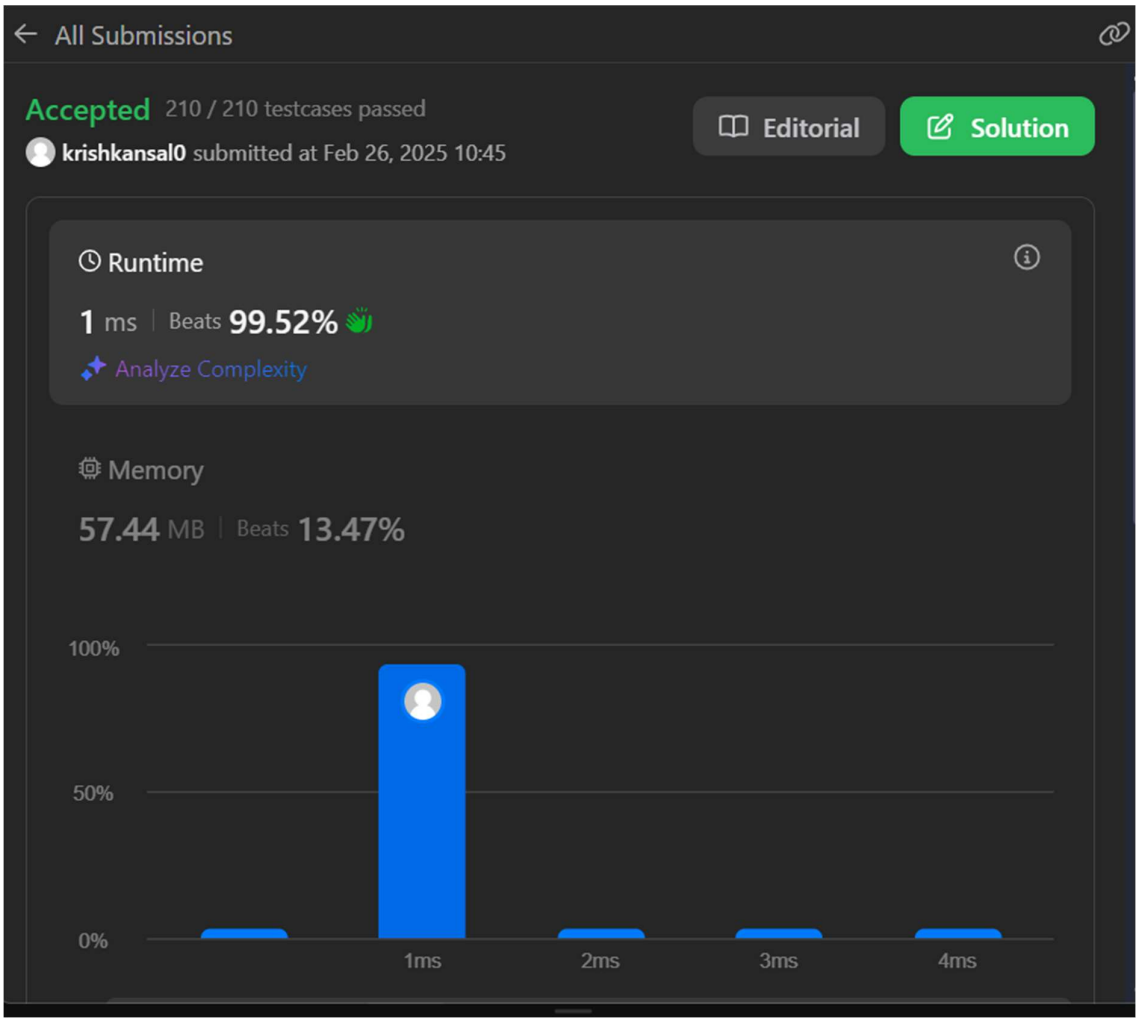
912.Sort an Array

```java
class Solution {
    public int[] sortArray(int[] nums) {
        mergeSort(nums, 0, nums.length - 1);
        return nums;
    }

    private void mergeSort(int[] nums, int left, int right) {
        if (left >= right) return;
        int mid = left + (right - left) / 2;
        mergeSort(nums, left, mid);
        mergeSort(nums, mid + 1, right);
        merge(nums, left, mid, right);
    }

    private void merge(int[] nums, int left, int mid, int right) {
        int[] temp = new int[right - left + 1];
        int i = left, j = mid + 1, k = 0;
        while (i <= mid && j <= right) {
            if (nums[i] <= nums[j]) temp[k++] = nums[i++];
            else temp[k++] = nums[j++];
        }
        while (i <= mid) temp[k++] = nums[i++];
        while (j <= right) temp[k++] = nums[j++];
        System.arraycopy(temp, 0, nums, left, temp.length);

    }
}
```



53.Maximum Subarray

```java
class Solution {
    public int maxSubArray(int[] nums) {
        int maxSum = nums[0], currentSum = nums[0];
        for (int i = 1; i < nums.length; i++) {
            currentSum = Math.max(nums[i], currentSum + nums[i]);
            maxSum = Math.max(maxSum, currentSum);
        }
        return maxSum;
    }
}
```



932.[Beautiful Array]

```java
class Solution {
  public int[] beautifulArray(int n) {
    int[] arr = new int[n];
    for (int i = 0; i < n; ++i)
      arr[i] = i + 1;
    divide(arr, 0, n - 1, 1);
    return arr;
  }

  private void divide(int[] arr, int l, int r, int mask) {
    if (l >= r)
      return;
    final int m = partition(arr, l, r, mask);
    divide(arr, l, m, mask << 1);
    divide(arr, m + 1, r, mask << 1);
  }

  private int partition(int[] arr, int l, int r, int mask) {
    int nextSwapped = l;
    for (int i = l; i <= r; ++i)
      if ((arr[i] & mask) > 0)
        swap(arr, i, nextSwapped++);
    return nextSwapped - 1;
  }

  private void swap(int[] arr, int i, int j) {
    final int temp = arr[i];
    arr[i] = arr[j];
```