DSA PRACTICE – DAY 5

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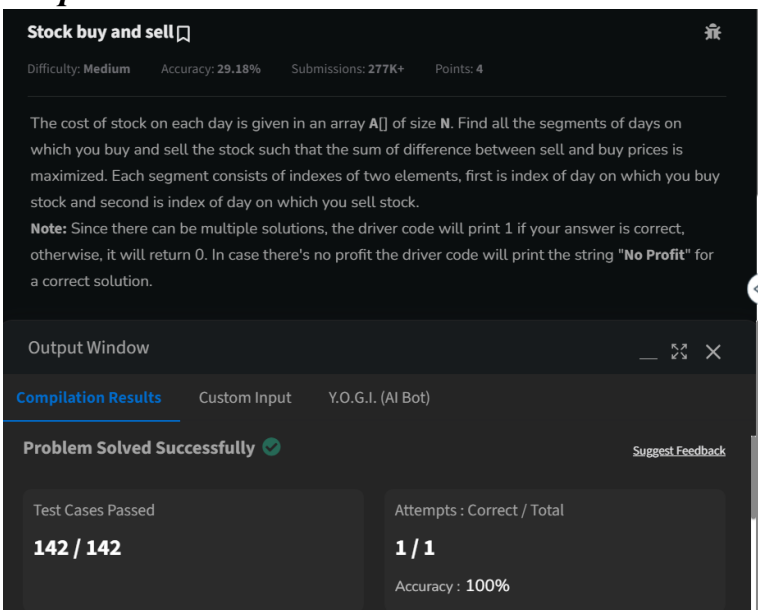
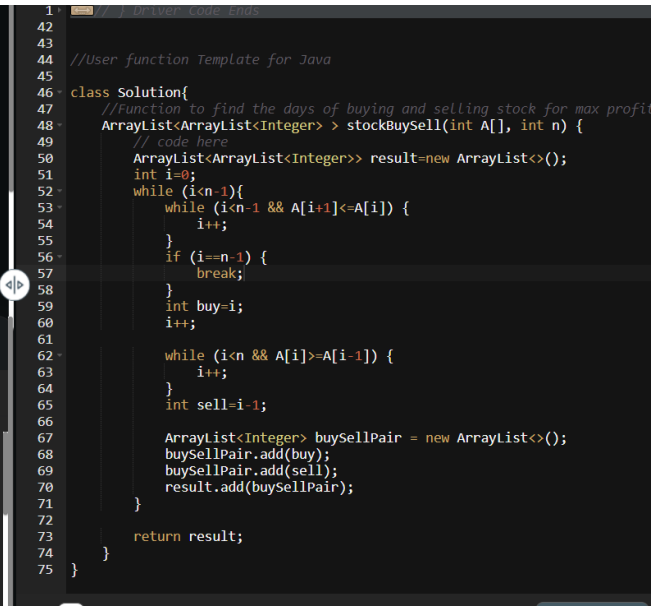
1. Stock Buy and Sell

Code Solution:

```
class Solution{
    ArrayList<ArrayList<Integer>> stockBuySell(int A[], int n) {
        ArrayList<ArrayList<Integer>> result=new ArrayList<>();
        int i=0;
        while (i<n-1){
            while (i<n-1 && A[i+1]<=A[i]) {
                i++;}
            if (i==n-1) break;
            int buy=i;
            i++;
            while (i<n && A[i]>=A[i-1]) {
                i++;}
            int sell=i-1;
            ArrayList<Integer> buySellPair = new ArrayList<>();
            buySellPair.add(buy);
            buySellPair.add(sell);
            result.add(buySellPair);
        }
        return result;
    }
}
```

Output:





```
// } Driver Code Ends


//User function Template for Java

class Solution{
    //Function to find the days of buying and selling stock for max profit.
    ArrayList<ArrayList<Integer> > stockBuySell(int A[], int n) {
        // code here
        ArrayList<ArrayList<Integer>> result=new ArrayList<>();
        int i=0;
        while (i<n-1){
            while (i<n-1 && A[i+1]<=A[i]) {
                i++;
            }
            if (i==n-1) {
                break;
            }
            int buy=i;
            i++;

            while (i<n && A[i]>=A[i-1]) {
                i++;
            }
            int sell=i-1;

            ArrayList<Integer> buySellPair = new ArrayList<>();
            buySellPair.add(buy);
            buySellPair.add(sell);
            result.add(buySellPair);
        }

        return result;
    }
}
```

Time complexity: O (n)

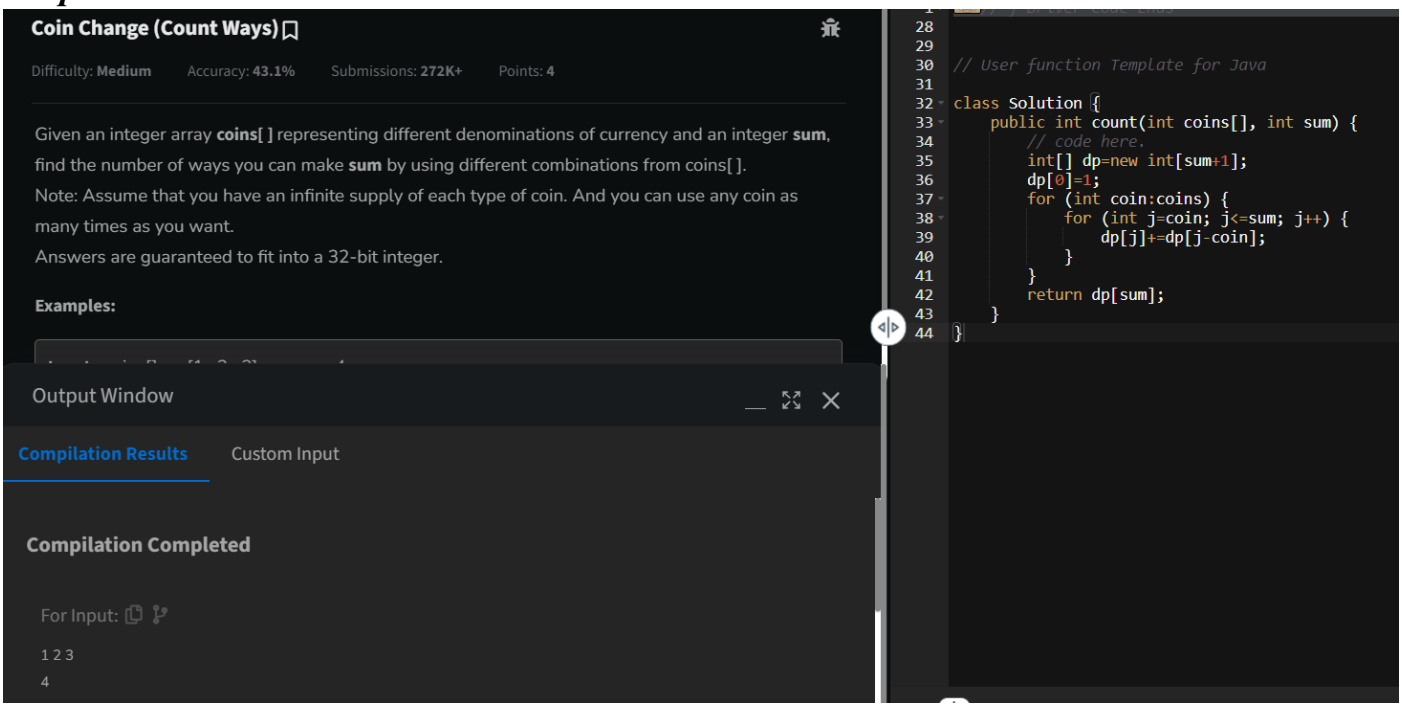
Space Complexity: O (n)

2. Minimize heights II

Code Solution:

```
class Solution {
    public int count(int coins[], int sum) {
        // code here.
        int[] dp=new int[sum+1];
        dp[0]=1;
        for (int coin:coins) {
            for (int j=coin; j<=sum; j++) {
                dp[j]+=dp[j-coin];
            }
        }
        return dp[sum];
    }
}
```

Output:



Time Complexity: O (m*n)
Space Complexity: O (m)

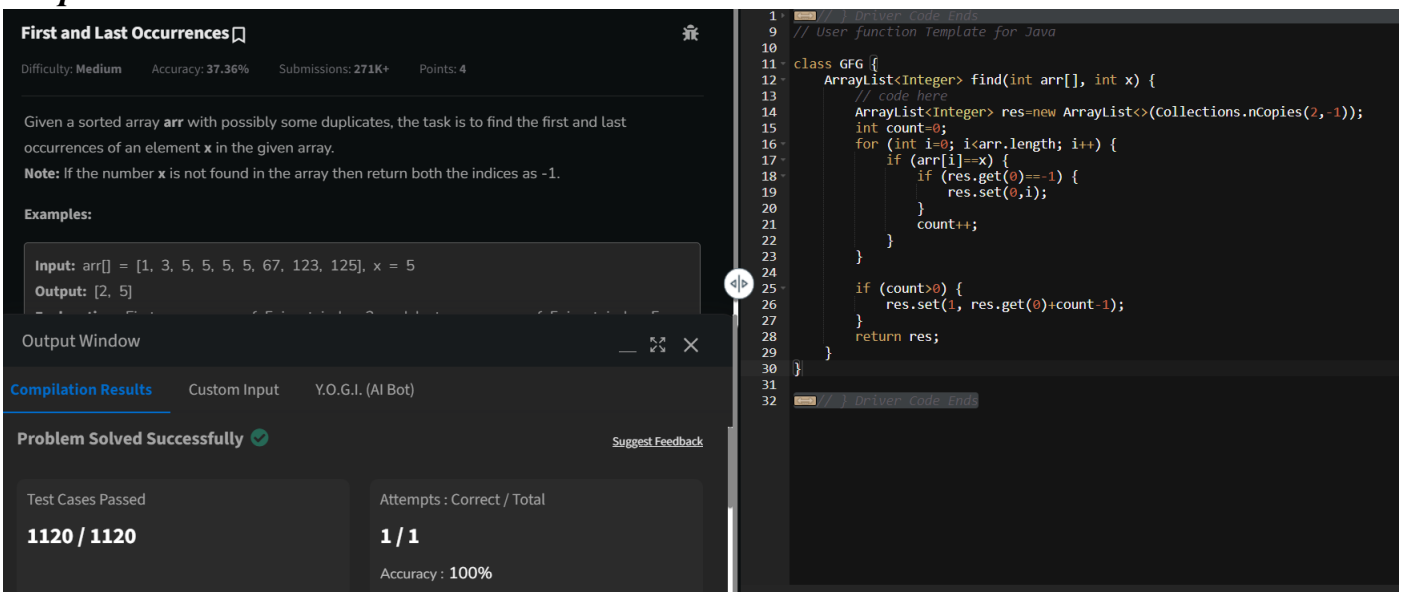
3. First and Last Occurences

Code Solution:

```
class GFG {
    ArrayList<Integer> find(int arr[], int x) {
        // code here
        ArrayList<Integer> res=new ArrayList<>(Collections.nCopies(2,-1));
        int count=0;
        for (int i=0; i<arr.length; i++) {
            if (arr[i]==x) {
                if (res.get(0)==-1) {
                    res.set(0,i);
                }
                count++;
            }
        }

        if (count>0) {
            res.set(1, res.get(0)+count-1);
        }
        return res;
    }
}
```

Output:



Time complexity: O (n)

Space Complexity: O (1)

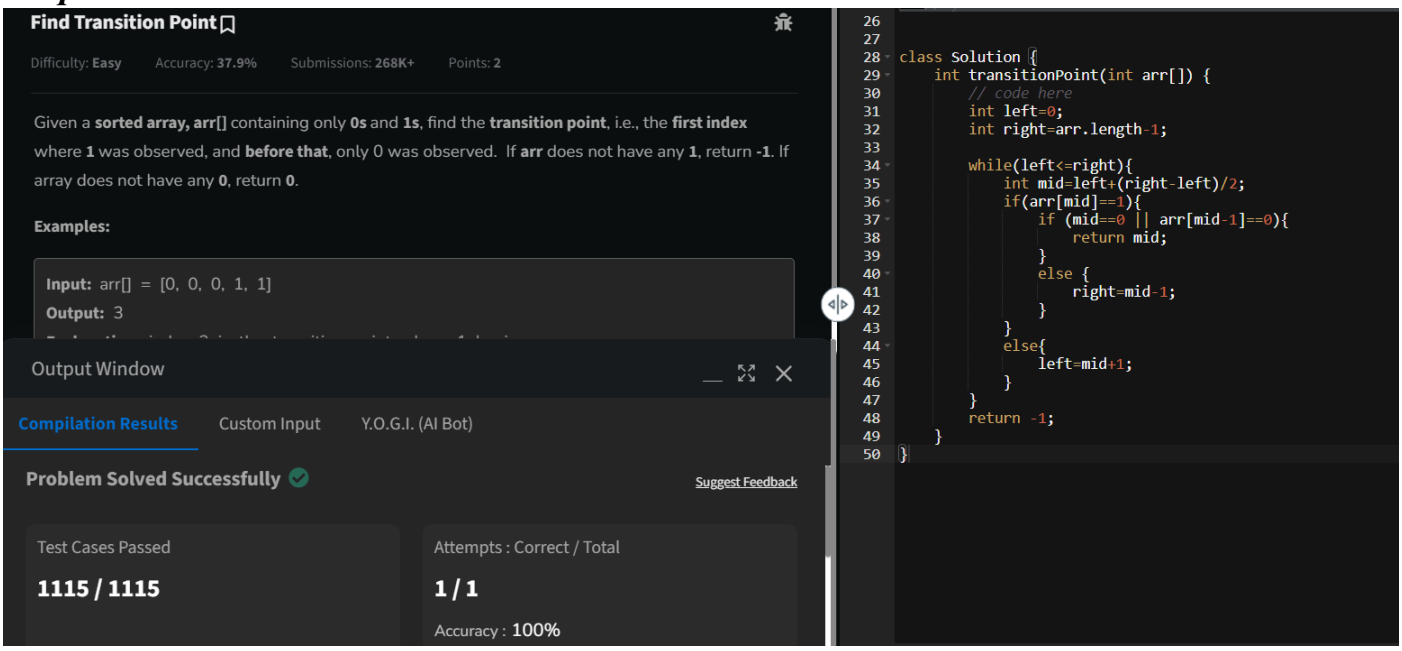
4. Fins Transition Point

Code Solution:

```
class Solution {
    int transitionPoint(int arr[]) {
        // code here
        int left=0;
        int right=arr.length-1;

        while(left<=right){
            int mid=left+(right-left)/2;
            if(arr[mid]==1){
                if (mid==0 || arr[mid-1]==0){
                    return mid;
                }
                else {
                    right=mid-1;
                }
            }
            else{
                left=mid+1;
            }
        }
        return -1;
    }
}
```

Output:



Time Complexity: O (logn)

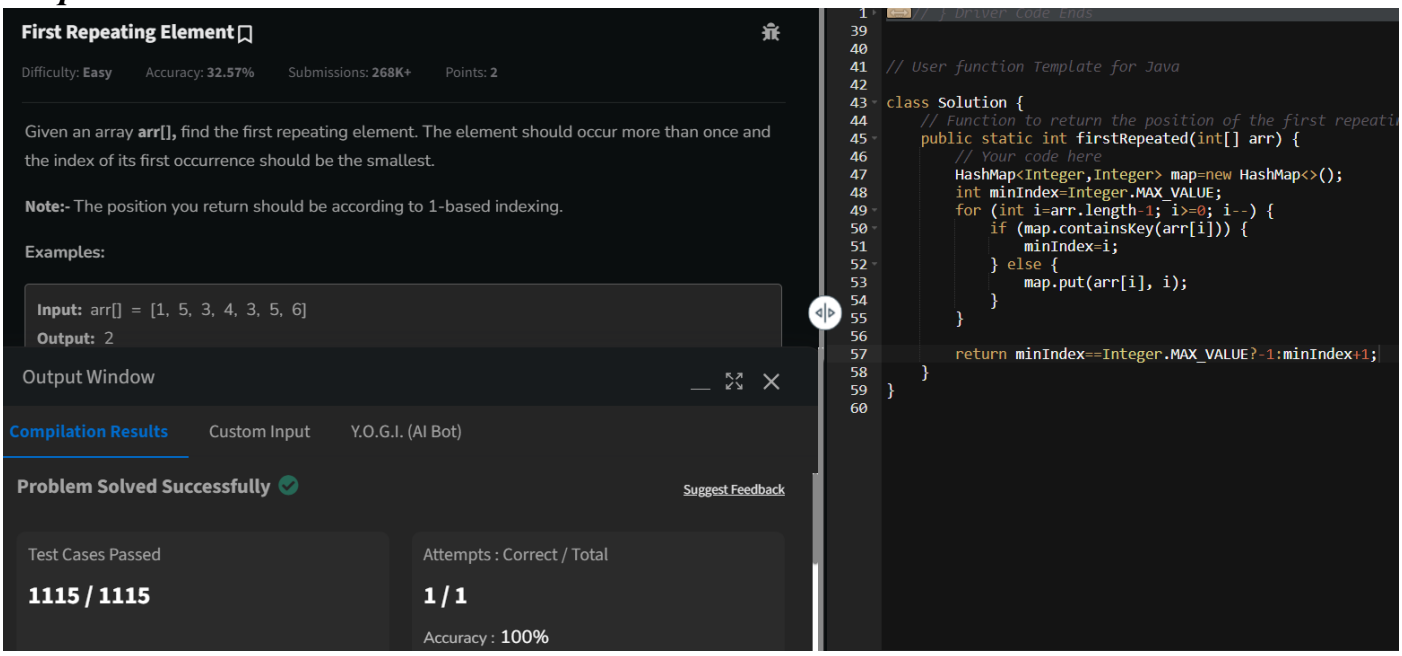
Space Complexity: O (1)

5. First Repeating Element

Code Solution:

```
class Solution {
    // Function to return the position of the first repeating element.
    public static int firstRepeated(int[] arr) {
        // Your code here
        HashMap<Integer,Integer> map=new HashMap<>();
        int minIndex=Integer.MAX_VALUE;
        for (int i=arr.length-1; i>=0; i--) {
            if (map.containsKey(arr[i])) {
                minIndex=i;
            } else {
                map.put(arr[i], i);
            }
        }
        return minIndex==Integer.MAX_VALUE?-1:minIndex+1;
    }
}
```

Output:



Time Complexity: O (n)

Space Complexity: O (n)

6. Remove Duplicates Sorted Array

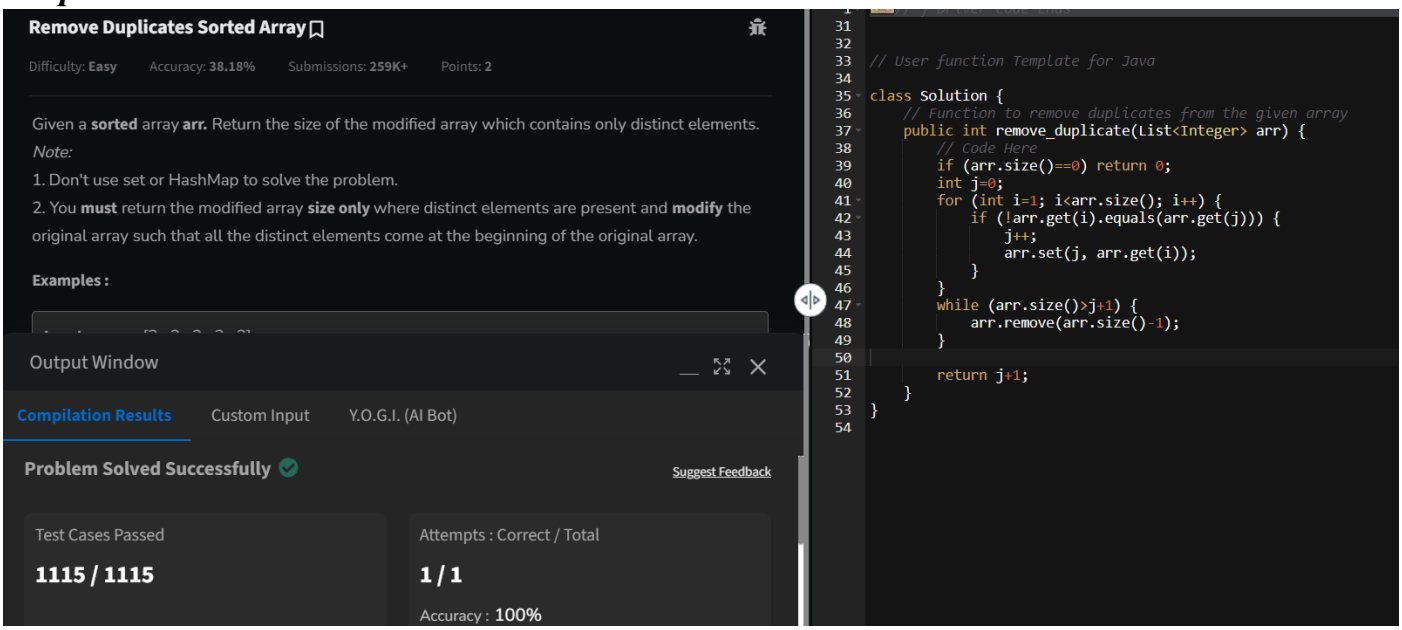
Code Solution:

```
class Solution {
    // Function to remove duplicates from the given array
    public int remove_duplicate(List<Integer> arr) {
```

```
        // Code Here
        if (arr.size()==0) return 0;
        int j=0;
        for (int i=1; i<arr.size(); i++) {
            if (!arr.get(i).equals(arr.get(j))) {
                j++;
                arr.set(j, arr.get(i));
            }
        }
        while (arr.size()>j+1) {
            arr.remove(arr.size()-1);
        }

        return j+1;
    }
}
```

Output:



Time Complexity: O (n)
Space Complexity: O (1)

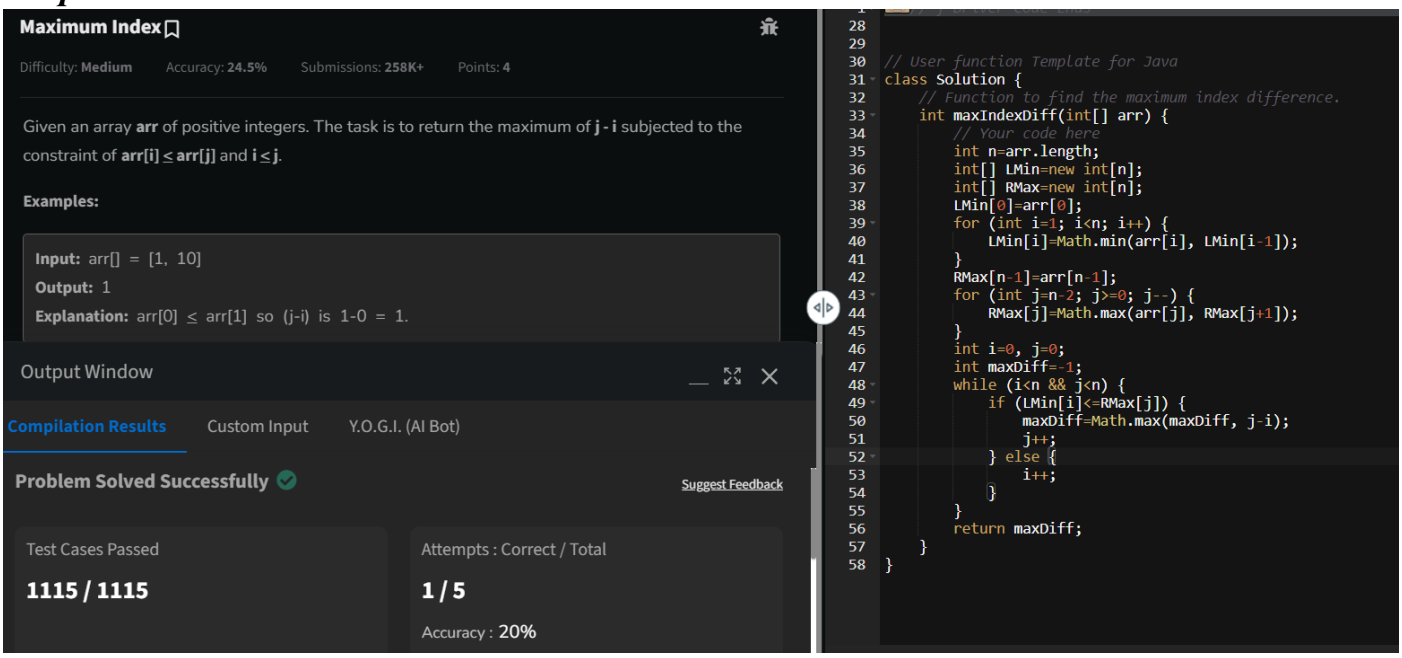
7. Maximum Index

Code Solution

```
class Solution {
    // Function to find the maximum index difference.
    int maxIndexDiff(int[] arr) {
        // Your code here
        int n=arr.length;
        int[] LMin=new int[n];
```

```
        int[] RMax=new int[n];
        LMin[0]=arr[0];
        for (int i=1; i<n; i++) {
            LMin[i]=Math.min(arr[i], LMin[i-1]);
        }
        RMax[n-1]=arr[n-1];
        for (int j=n-2; j>=0; j--) {
            RMax[j]=Math.max(arr[j], RMax[j+1]);
        }
        int i=0, j=0;
        int maxDiff=-1;
        while (i<n && j<n) {
            if (LMin[i]<=RMax[j]) {
                maxDiff=Math.max(maxDiff, j-i);
                j++;
            } else {
                i++;
            }
        }
        return maxDiff;
    }
}
```

Output:



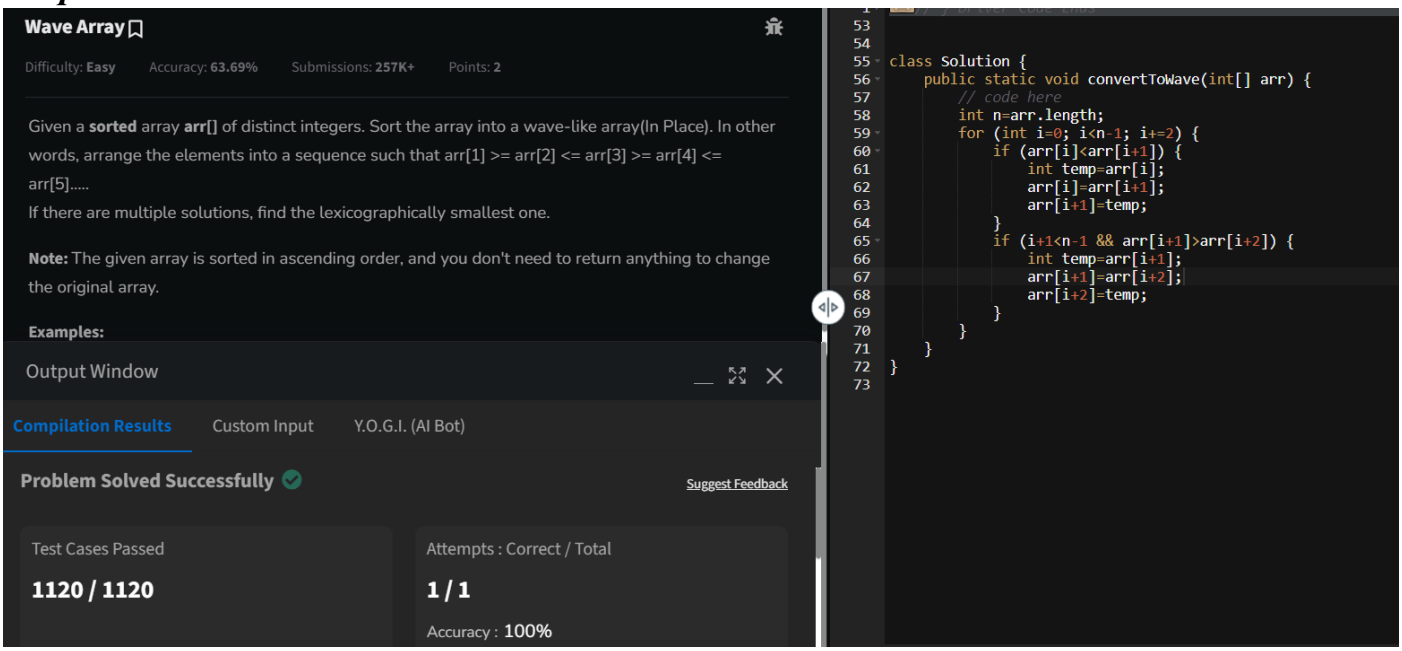
Time Complexity: O (n)
Space Complexity: O (n)

7.

Code Solution

```
class Solution {
    public static void convertToWave(int[] arr) {
        // code here
        int n=arr.length;
        for (int i=0; i<n-1; i+=2) {
            if (arr[i]<arr[i+1]) {
                int temp=arr[i];
                arr[i]=arr[i+1];
                arr[i+1]=temp;
            }
            if (i+1<n-1 && arr[i+1]>arr[i+2]) {
                int temp=arr[i+1];
                arr[i+1]=arr[i+2];
                arr[i+2]=temp;
            }
        }
    }
}
```

Output:



Time Complexity: O (n)

Space Complexity: O (1)