Experiment – 1.1

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Branch: CSE **Section/Group: 707/B**

Subject Name: Competitive Coding II **Subject Code: 20CSP-351**

1. Aim: 3Sum

2. Objective:

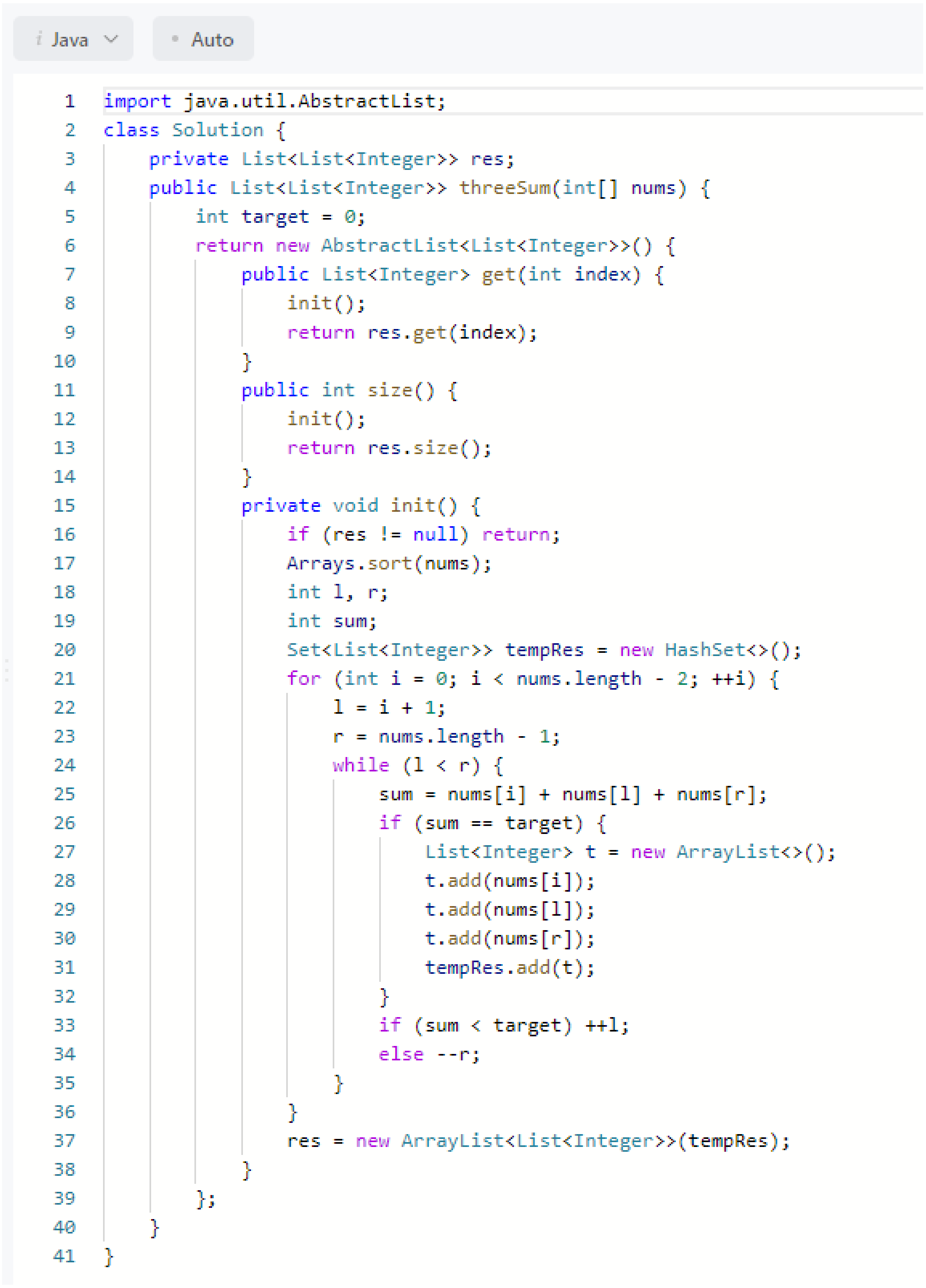
Given an integer array nums, return all the triplets [nums[i], nums[j], nums[k]] such that i != j, i != k, and j != k, and nums[i] + nums[j] + nums[k] == 0.
Notice that the solution set must not contain duplicate triplets.

Example 1:
Input: nums = [-1,0,1,2,-1,-4]
Output: [[-1,-1,2],[-1,0,1]]

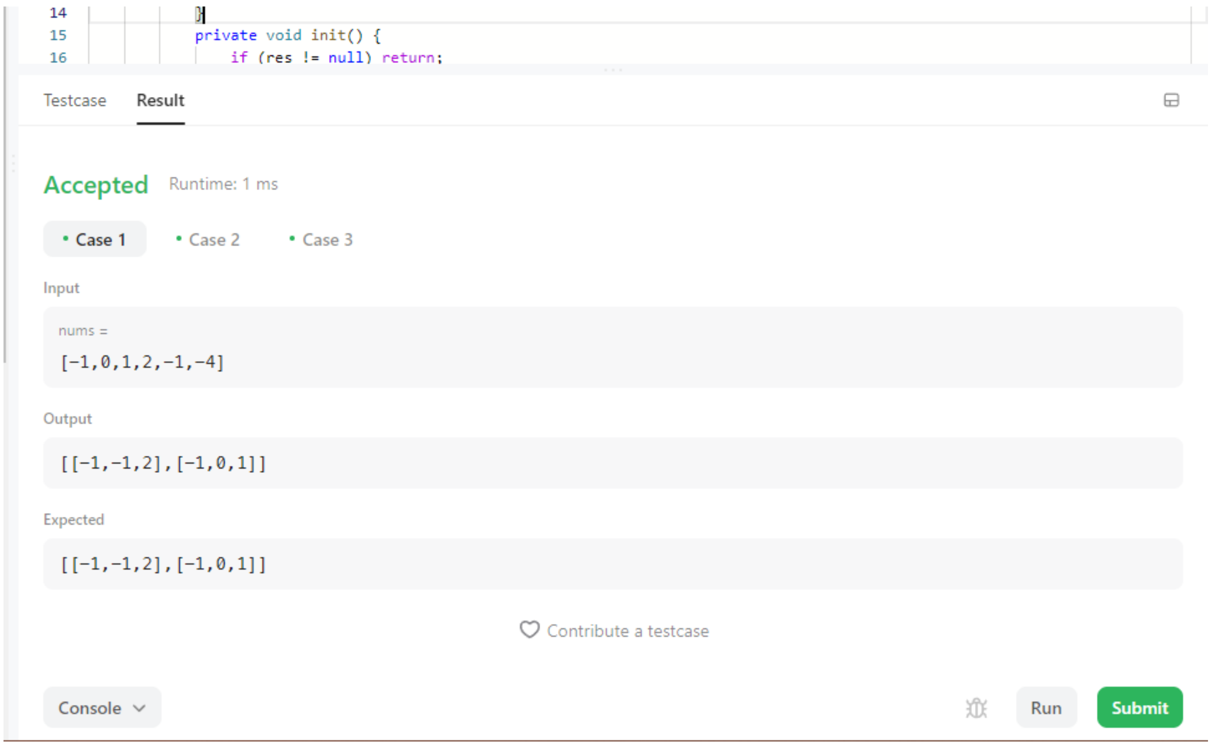
3. Code:

```
import java.util.AbstractList;
class Solution {
    private List<List<Integer>> res;
    public List<List<Integer>> threeSum(int[] nums) {
        int target = 0;
        return new AbstractList<List<Integer>>() {
            public List<Integer> get(int index) {
                init();
                return res.get(index);
            }
            public int size() {
                init();
                return res.size();
}
            private void init() {
                if (res != null) return;
                Arrays.sort(nums);
                int l, r;
                int sum;
                Set<List<Integer>> tempRes = new HashSet<>();
                for (int i = 0; i < nums.length - 2; ++i) {
                   l = i + 1;
                   r = nums.length - 1;
                   while (l < r) {
                      sum = nums[i] + nums[l] + nums[r];
                      if (sum == target) {
                         List<Integer> t = new ArrayList<>();
                         t.add(nums[i]);
                         t.add(nums[l]);
                         t.add(nums[r]);
                         tempRes.add(t);
                      }
                      if (sum < target) ++l;
                      else --r;
                   }
                }
                res = new ArrayList<List<Integer>>(tempRes);
            }
        };
    }
}
```

4. Output:


Java
Auto

```java
import java.util.AbstractList;
class Solution {
    private List<List<Integer>> res;
    public List<List<Integer>> threeSum(int[] nums) {
        int target = 0;
        return new AbstractList<List<Integer>>() {
            public List<Integer> get(int index) {
                init();
                return res.get(index);
            }
            public int size() {
                init();
                return res.size();
            }
            private void init() {
                if (res != null) return;
                Arrays.sort(nums);
                int l, r;
                int sum;
                Set<List<Integer>> tempRes = new HashSet<>();
                for (int i = 0; i < nums.length - 2; ++i) {
                    l = i + 1;
                    r = nums.length - 1;
                    while (l < r) {
                        sum = nums[i] + nums[l] + nums[r];
                        if (sum == target) {
                            List<Integer> t = new ArrayList<>();
                            t.add(nums[i]);
                            t.add(nums[l]);
                            t.add(nums[r]);
                            tempRes.add(t);
                        }
                        if (sum < target) ++l;
                        else --r;
                    }
                }
                res = new ArrayList<List<Integer>>(tempRes);
            }
        };
    }
}
```



```
    }
    private void init() {
        if (res != null) return;
```

Accepted Runtime: 1 ms

Input

```
nums =
[-1,0,1,2,-1,-4]
```

Output

```
[[-1,-1,2],[-1,0,1]]
```

Expected

```
[[-1,-1,2],[-1,0,1]]
```

Submitted By – Avinash Jena

5. Aim: Merge Two Sorted Lists

6. Objective:

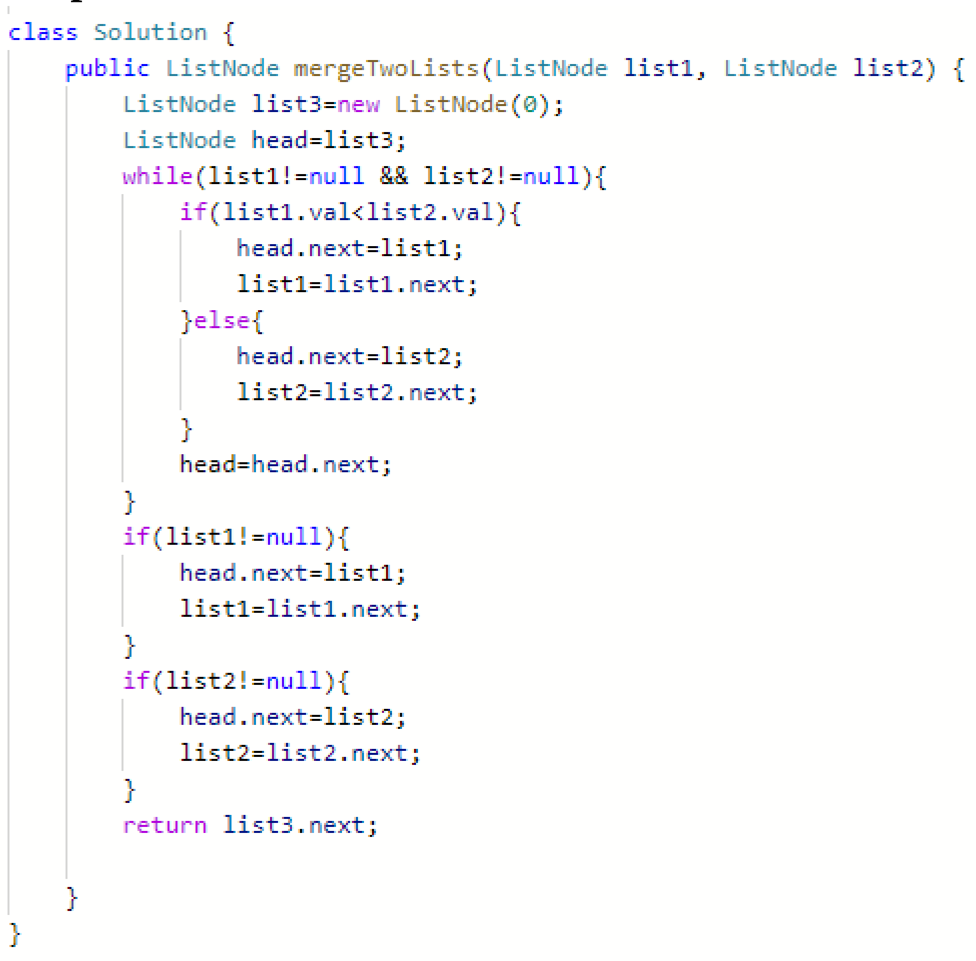
You are given the heads of two sorted linked lists list1 and list2.
Merge the two lists in a one sorted list. The list should be made by splicing together the nodes of the first two lists.
Return the head of the merged linked list.

Example 1:
Input: list1 = [1,2,4], list2 = [1,3,4]
Output: [1,1,2,3,4,4]
Example 2:
Input: list1 = [], list2 = []
Output: []

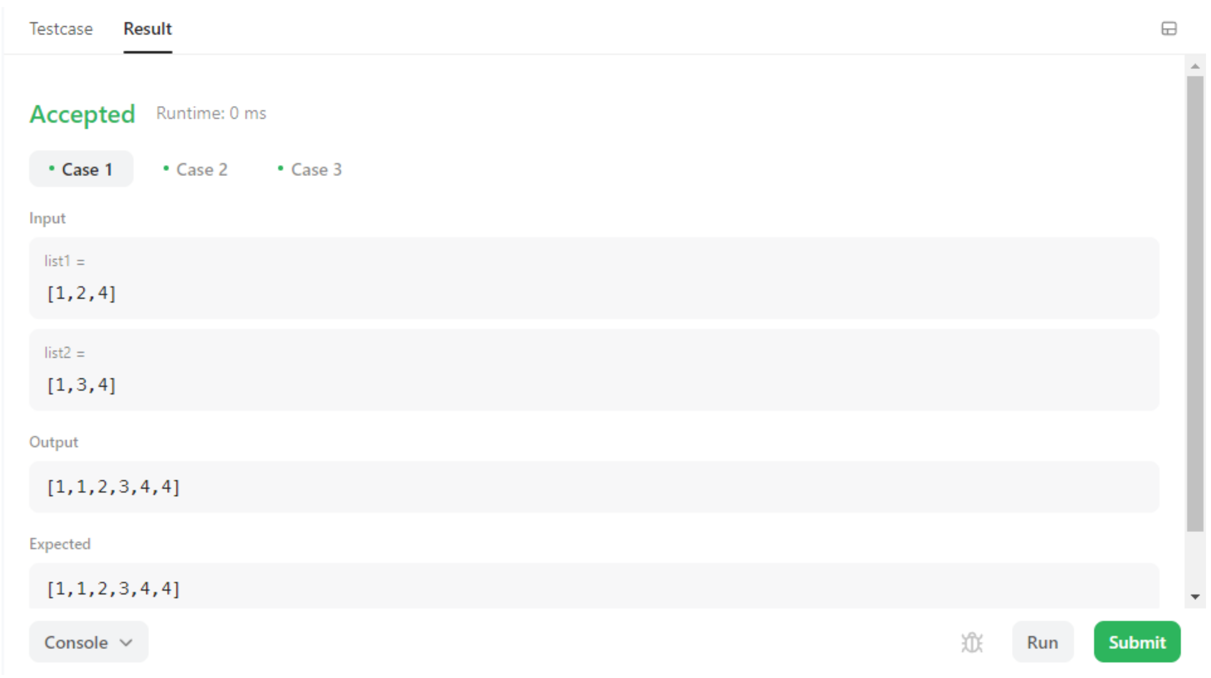
7. Code:

```
class Solution {
    public ListNode mergeTwoLists(ListNode list1, ListNode list2) {
        ListNode list3=new ListNode(0);
        ListNode head=list3;

  while(list1!=null && list2!=null){
            if(list1.val<list2.val){
                head.next=list1;
                list1=list1.next;
            }else{
                head.next=list2;
                list2=list2.next;
            }
            head=head.next;
        }
        if(list1!=null){
            head.next=list1;
            list1=list1.next;
        }
        if(list2!=null){
            head.next=list2;
            list2=list2.next;
         }
         return list3.next;

      }
   }
```

8. Output:



```
class Solution {
    public ListNode mergeTwoLists(ListNode list1, ListNode list2) {
        ListNode list3=new ListNode(0);
        ListNode head=list3;
        while(list1!=null && list2!=null){
            if(list1.val<list2.val){
                head.next=list1;
                list1=list1.next;
            }else{
                head.next=list2;
                list2=list2.next;
            }
            head=head.next;
        }
        if(list1!=null){
            head.next=list1;
            list1=list1.next;
        }
        if(list2!=null){
            head.next=list2;
            list2=list2.next;
        }
        return list3.next;

    }
}
```



Accepted Runtime: 0 ms

Input

list1 =
```
[1,2,4]
```
list2 =
```
[1,3,4]
```
Output
```
[1,1,2,3,4,4]
```
Expected
```
[1,1,2,3,4,4]
```

Submitted By – Avinash Jena