DSA- Assignment-3

Questions List :-

1. Question was- https://leetcode.com/problems/climbing-stairs/description/

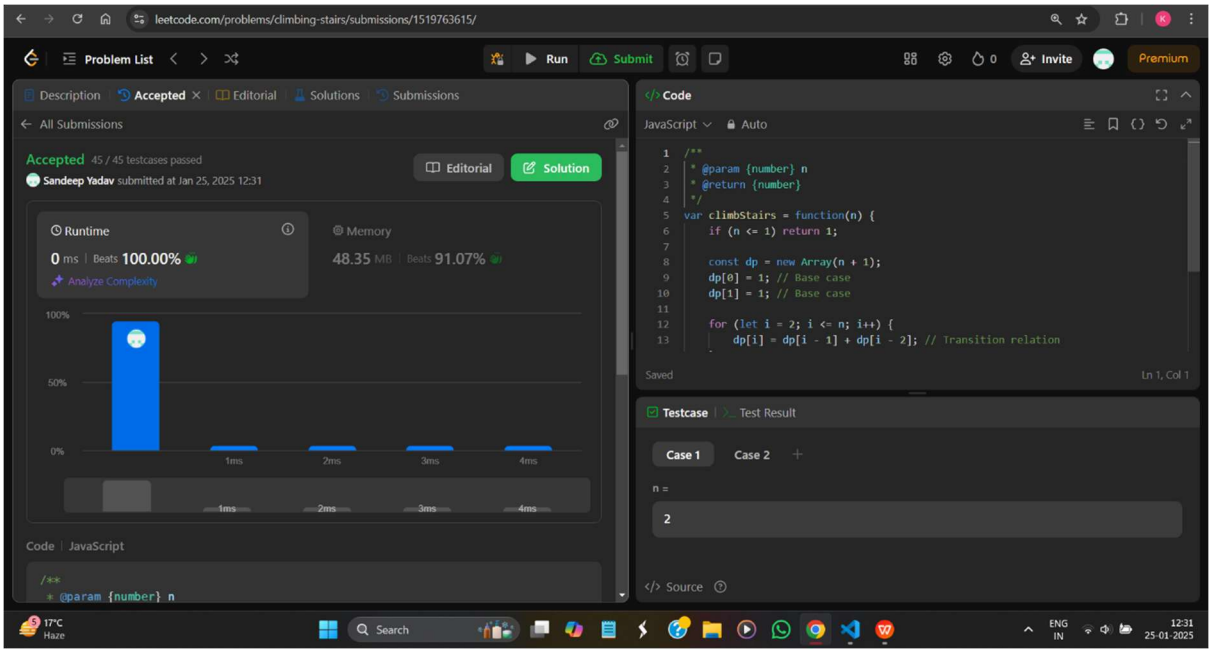
Solution Link – https://leetcode.com/problems/climbing-stairs/submissions/1519763615/

Description:

(i) If n <= 1 return 1 because only one way to climb.
(ii) Create new Array length of n + 1.
(iii) Define base cases dp[0] & dp[1] = 1 because in both cases only one way to climb.
(iv) Iterate 2 to n and find the way for I - 1 and i – 2.

Time Complexity: O(n)

Space Complexity: O(n)



2. Question was- https://leetcode.com/problems/merge-two-sorted-lists/description/

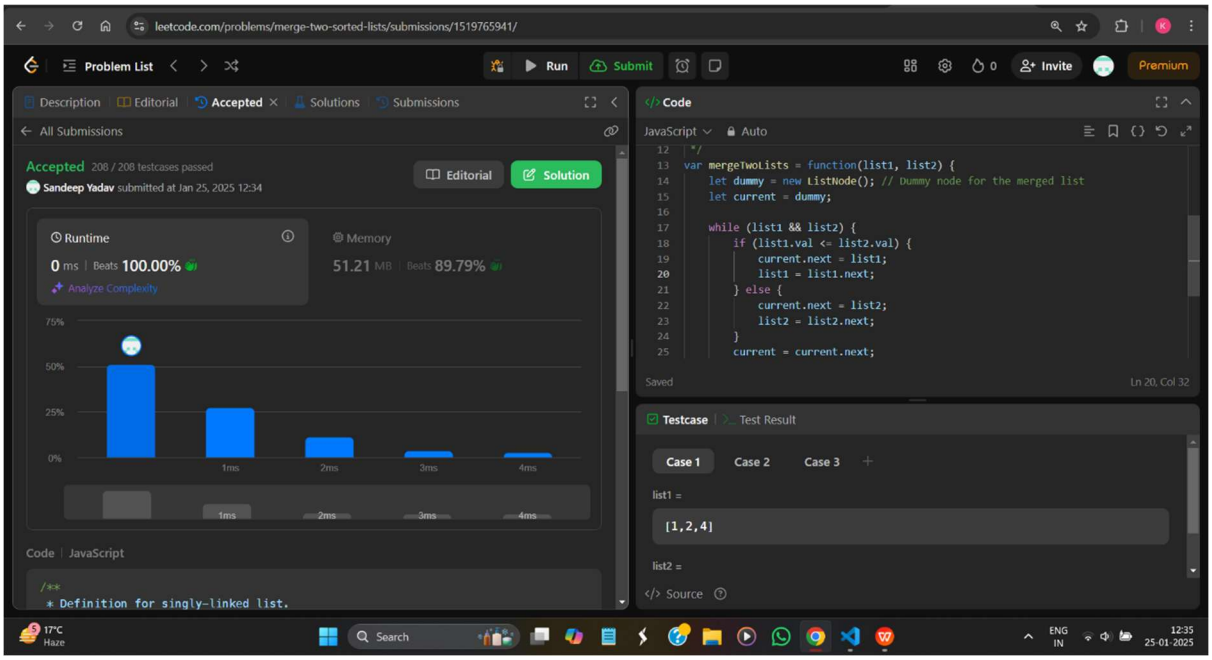
Solution Link- https://leetcode.com/problems/merge-two-sorted-lists/submissions/1519765941/

Description:

(i) Create new dummy node for merge List.
(ii) Create new current node and assign dummy in current.
(iii) Compare values between list1 and list2 and take the small value in current and move current.next.
(iv) And also move the pointer on current.next.
(v) Attach Attach the remaining nodes, if any.
(vi) Return dummy.next.

Time Complexity: O(n+m) // (for sorting array)

Space Complexity: O(1) (Not use any extra space,in-place merge)



3. Question was- https://leetcode.com/problems/palindrome-linked-list/description/

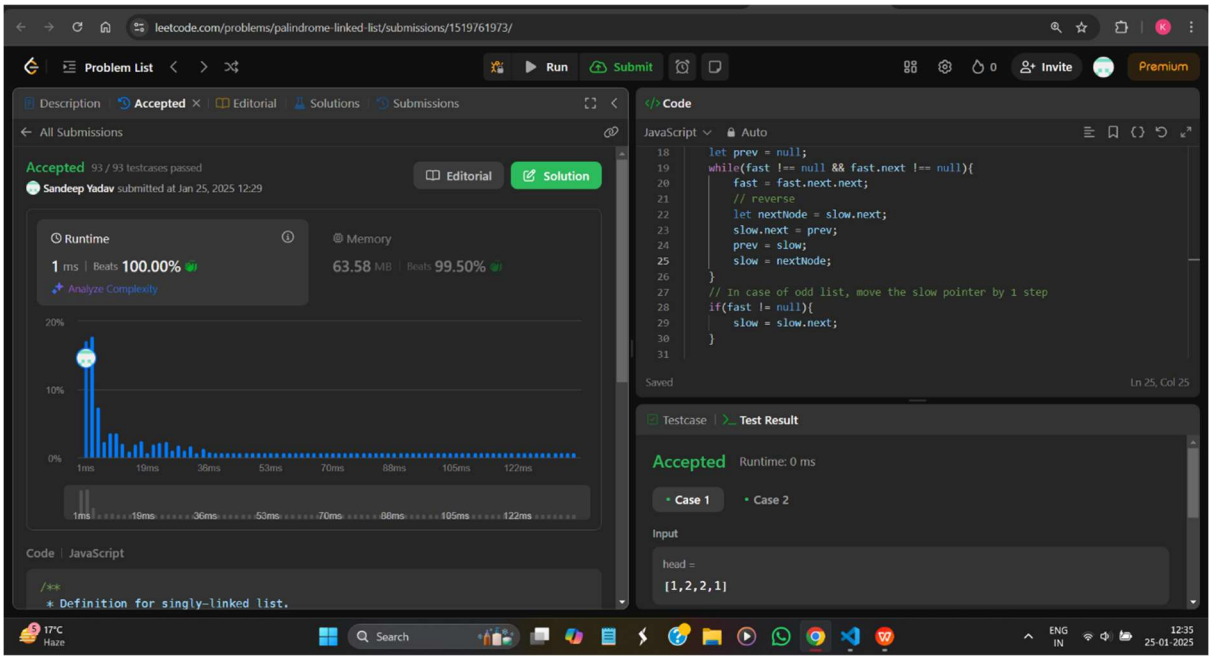
Solution Link– https://leetcode.com/problems/palindrome-linked-list/submissions/1519761973/

Description:

(i) Reverse the half List.
(ii) Campare 1st Half from Second Half.
(iii) If all node values are matched return true .
(iv) If all node values are not matched then return false.

Time Complexity: O(n) n is length of List.

Space Complexity: *O(1)* no use extra space



4. Question was- https://leetcode.com/problems/linked-list-cycle/

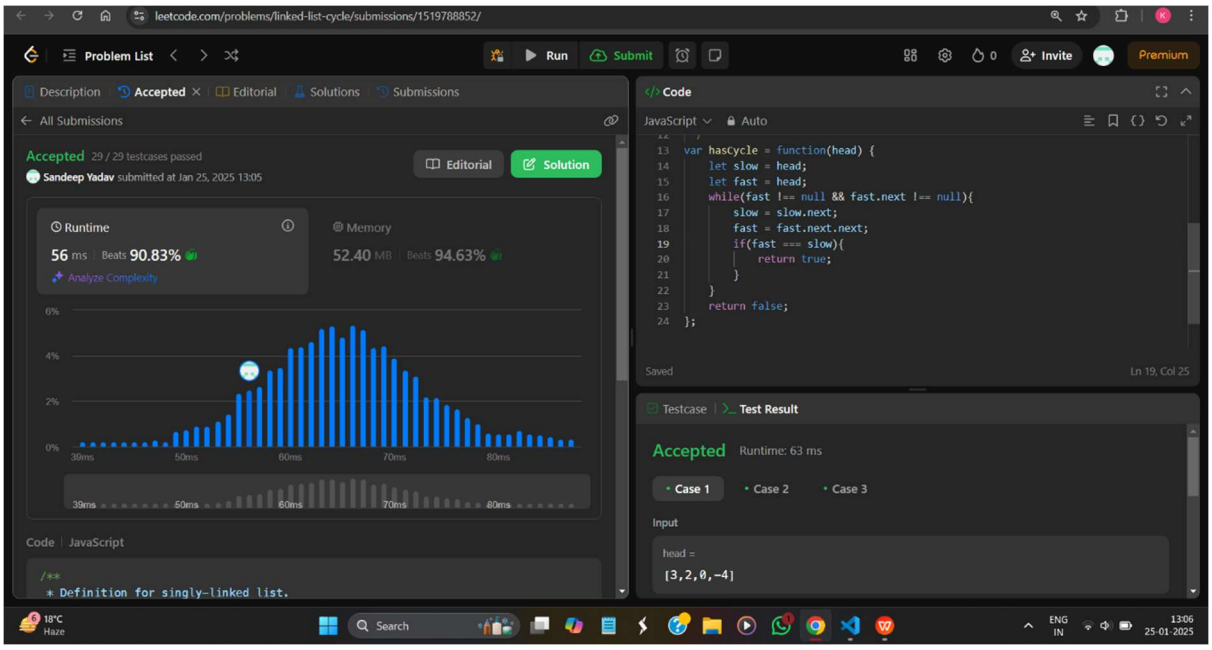
Solution Link– https://leetcode.com/problems/linked-list-cycle/submissions/1519788852/

Description:

(i) Create slow and fast pointer.
(ii) Traverse all the nodes till the fast & fast.next not equal to null.
(iii) Slow move step and fast move 2 step at a time.
(iv) If slow === fast then return true.
(v) If slow !== fast means, cycle not present return false.

Time Complexity: O(n + k) n is the numbers of nodes and k is the cycle length

Space Complexity: O(1) no extra space



5. Question was- https://leetcode.com/problems/remove-nth-node-from-end-of-list/description/

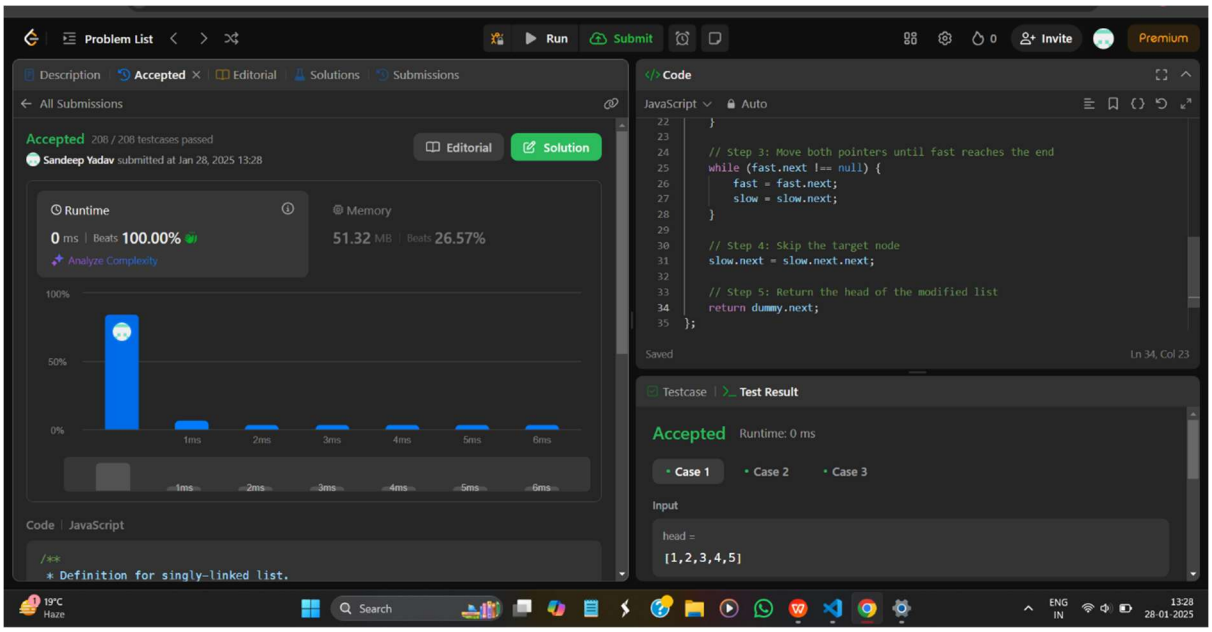
Solution Link- https://leetcode.com/problems/remove-nth-node-from-end-of-list/submissions/1523019444/

Description:

(i) Create a dummy node pointing to head (for handle edge cases easily).
(ii) Move the fast pointer n steps ahead.
(iii) Move both pointers until fast reaches the end.
(iv) Skip the target node.
(v) Return head of the modified List.

Time Complexity: O(L), single traversal using two pointers. // L is length of List

Space Complexity: O(1) no use extra space



6. Question was- https://leetcode.com/problems/powx-n/description/

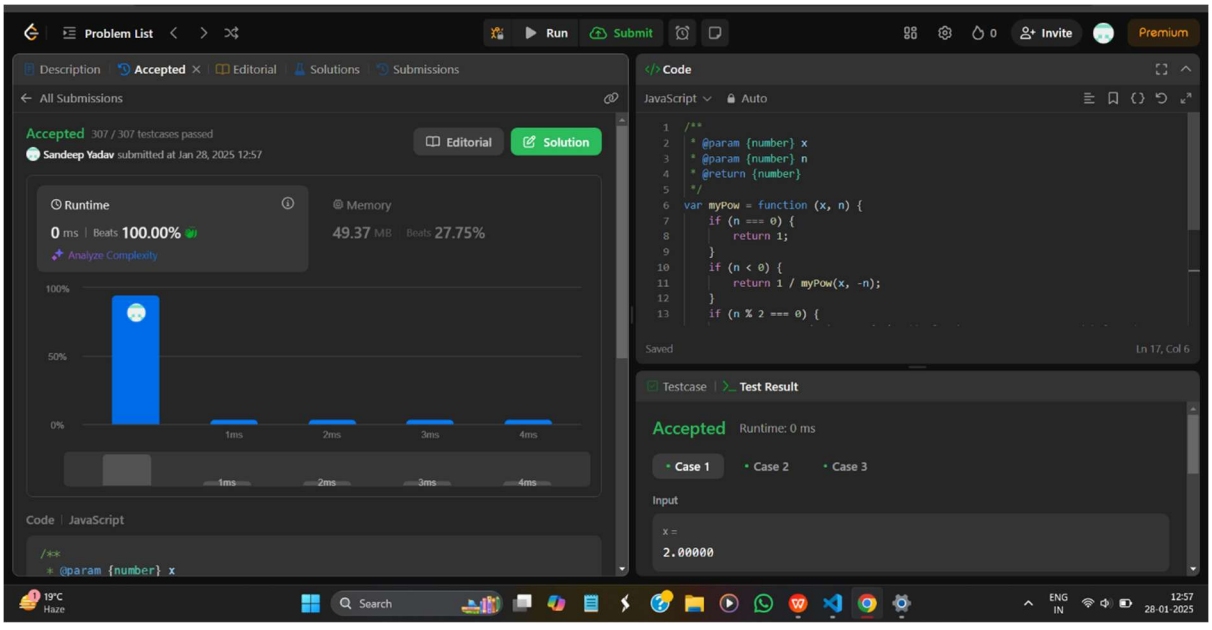
Solution Link- https://leetcode.com/problems/powx-n/submissions/1522997596/

Description:

(i) If n === 0 return 1 because any number who have 0 pow = 1 .
(ii) If n < 0 means pow is negative then return 1/result.
(iii) If n id odd number call x * myPow(x * x, (n - 1) / 2).
(iv) If n is even call myPow(x * x, (n - 1) / 2).

Time Complexity: O(n)

Space Complexity: O(1) no use extra space



7. Question was- https://leetcode.com/problems/delete-node-in-a-linked-list/description/

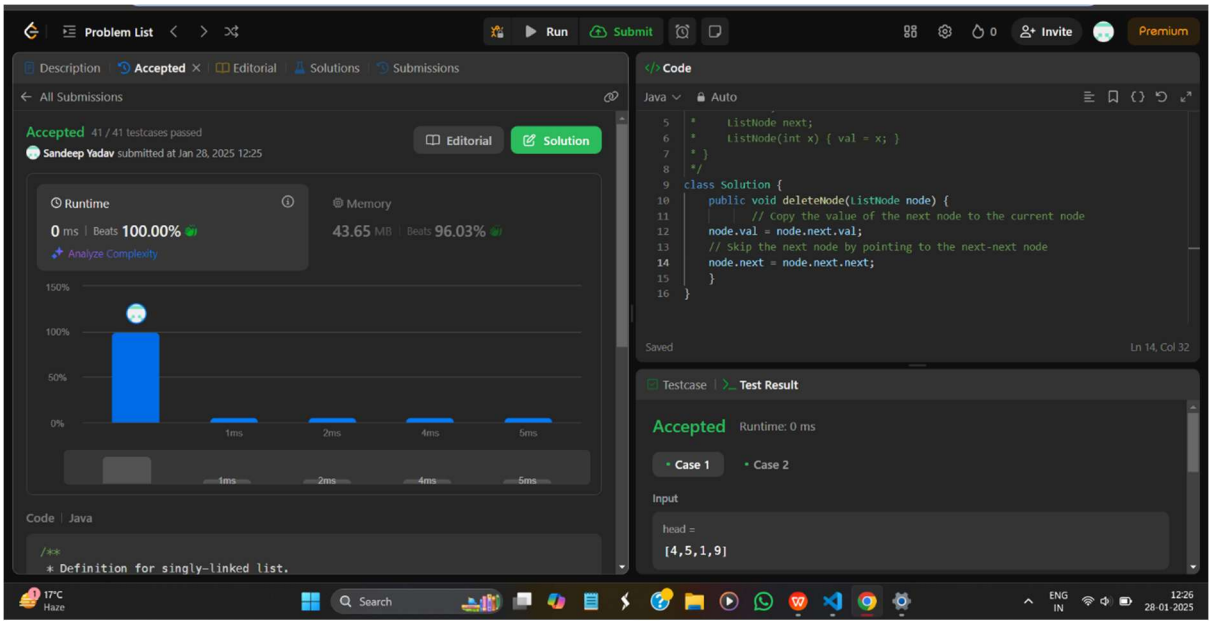
Solution Link- https://leetcode.com/problems/delete-node-in-a-linked-list/submissions/1522973045/

Description:

(i) Copy the value of next node to the current node.
(ii) Skip the next node by pointing to next.next node.

Time Complexity: O(1)// Not Traversing entire List

Space Complexity: O(1) no use extra space



Key Features :-

- Solutions are less time taking.

Difficulties :-

- Facing Difficulties in Code Optimization.
- Try to make code efficient and use better approach to solve them.

GitHub Repository Link : -

https://github.com/SandyBhai03/Internshala-Assignments/blob/main/Assignment-Course5/DSA-2/Assignment-3/app.js