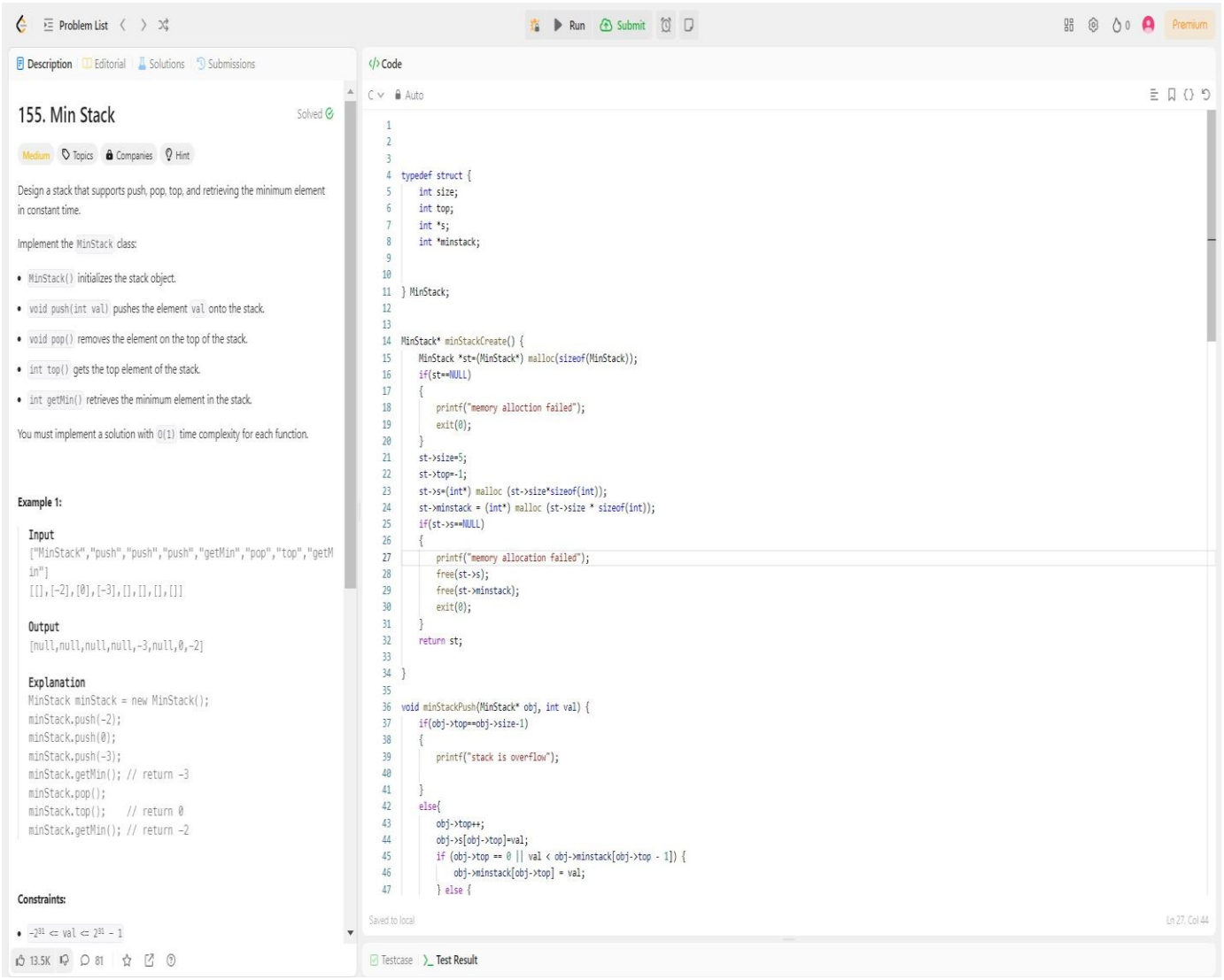
Leetcode minstack



Problem List

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155. Min Stack

Solved

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Design a stack that supports push, pop, top, and retrieving the minimum element in constant time.

Implement the `MinStack` class:

- `MinStack()` initializes the stack object.
- `void push(int val)` pushes the element `val` onto the stack.
- `void pop()` removes the element on the top of the stack.
- `int top()` gets the top element of the stack.
- `int getMin()` retrieves the minimum element in the stack.

You must implement a solution with `O(1)` time complexity for each function.

Example 1:

Input

```
["MinStack","push","push","push","getMin","pop","top","getMin"]
[[],[-2],[0],[-3],[],[],[],[]]
```

Output

```
[null,null,null,null,-3,null,0,-2]
```

Explanation

```
MinStack minStack = new MinStack();
minStack.push(-2);
minStack.push(0);
minStack.push(-3);
minStack.getMin(); // return -3
minStack.pop();
minStack.top();    // return 0
minStack.getMin(); // return -2
```

Constraints:

- $-2^{31} <= val <= 2^{31} - 1$

13.5K | 81

Code

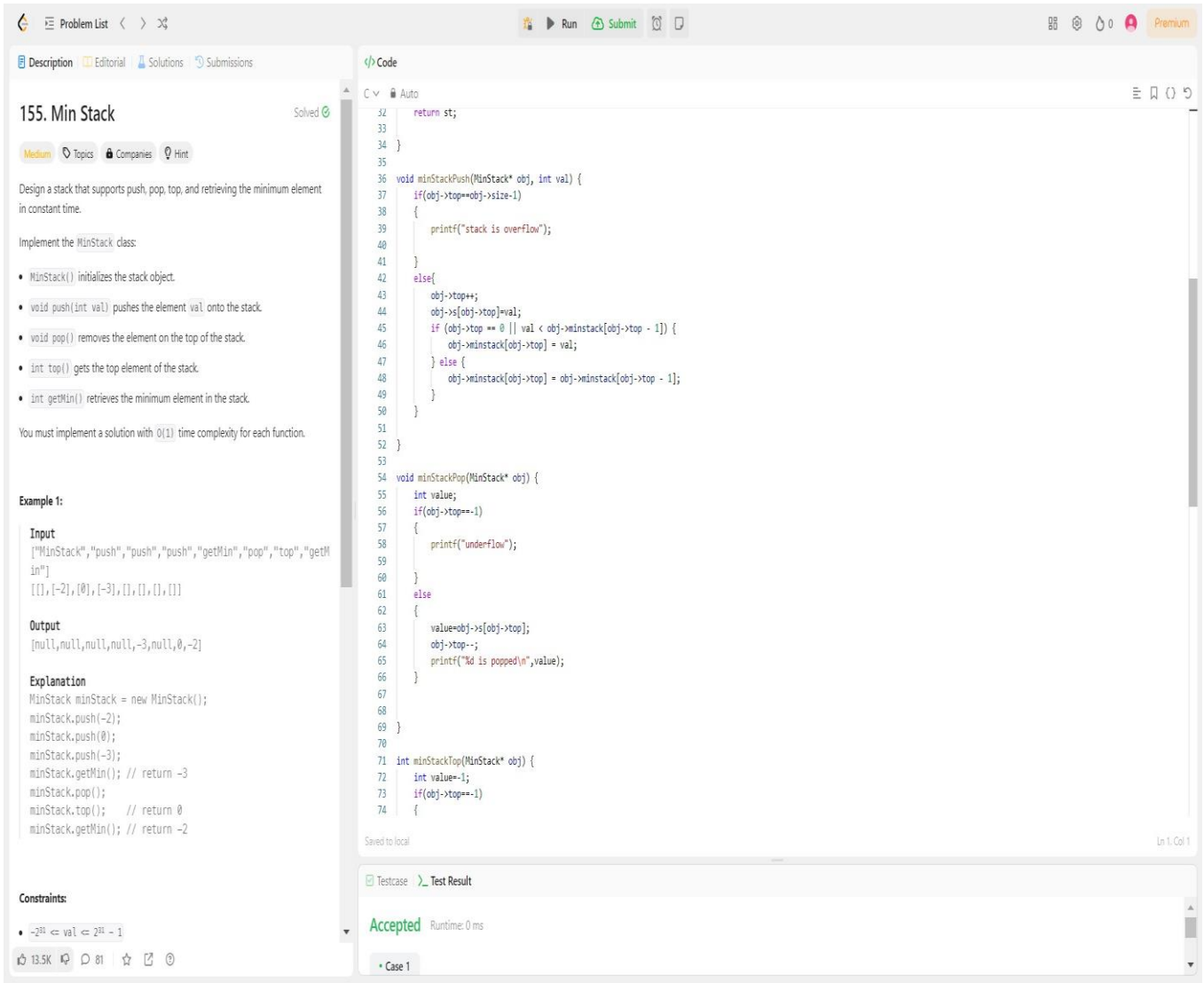
C | Auto

```c

typedef struct {
    int size;
    int top;
    int *s;
    int *minstack;

} MinStack;

MinStack* minStackCreate() {
    MinStack *st=(MinStack*) malloc(sizeof(MinStack));
    if(st==NULL)
    {
        printf("memory alloction failed");
        exit(0);
    }
    st->size=5;
    st->top=-1;
    st->s=(int*) malloc (st->size*sizeof(int));
    st->minstack = (int*) malloc (st->size * sizeof(int));
    if(st->s==NULL)
    {
        printf("memory allocation failed");
        free(st->s);
        free(st->minstack);
        exit(0);
    }
    return st;

}
void minStackPush(MinStack* obj, int val) {
    if(obj->top==obj->size-1)
    {
        printf("stack is overflow");

    }
    else{
        obj->top++;
        obj->s[obj->top]=val;
        if (obj->top == 0 || val < obj->minstack[obj->top - 1]) {
            obj->minstack[obj->top] = val;
        } else {
```

Saved to local

Ln 27, Col 44

Testcase | Test Result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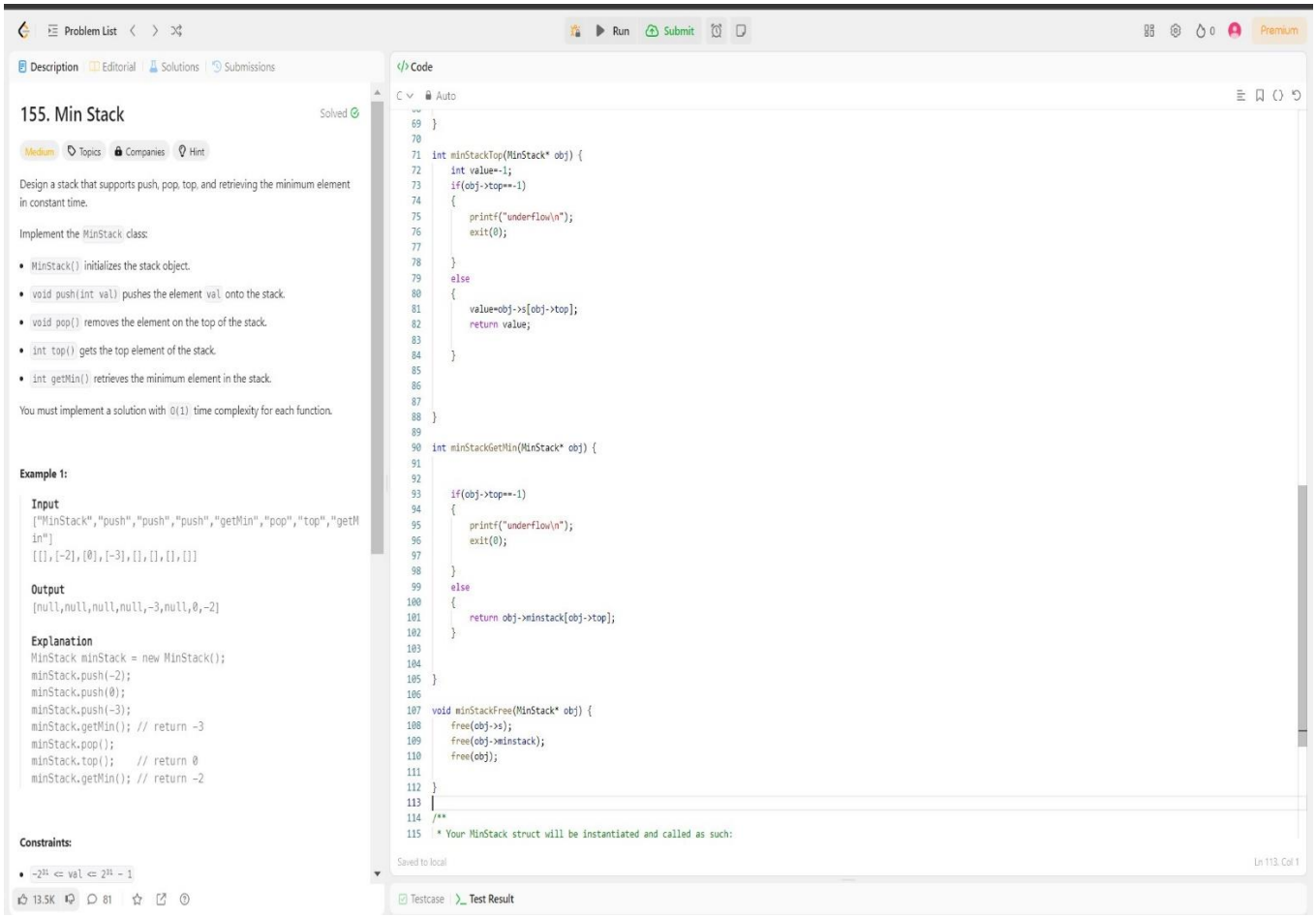
Constraints:
-2^31 <= val <= 2^31 - 1
13.5K
81
C
Auto
return st;
}
void minStackPush(MinStack* obj, int val) {
if(obj->top==obj->size-1)
{
printf("stack is overflow");
}
else{
obj->top++;
obj->s[obj->top]=val;
if (obj->top == 0 || val < obj->minstack[obj->top - 1]) {
obj->minstack[obj->top] = val;
} else {
obj->minstack[obj->top] = obj->minstack[obj->top - 1];
}
}
}
void minStackPop(MinStack* obj) {
int value;
if(obj->top==-1)
{
printf("underflow");
}
else
{
value=obj->s[obj->top];
obj->top--;
printf("%d is popped\n",value);
}
}
int minStackTop(MinStack* obj) {
int value=-1;
if(obj->top==-1)
{
Saved to local
Ln 1, Col 1
Testcase
Test Result
Accepted
Runtime: 0 ms
Case 1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Explanation
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minStack.push(-2);
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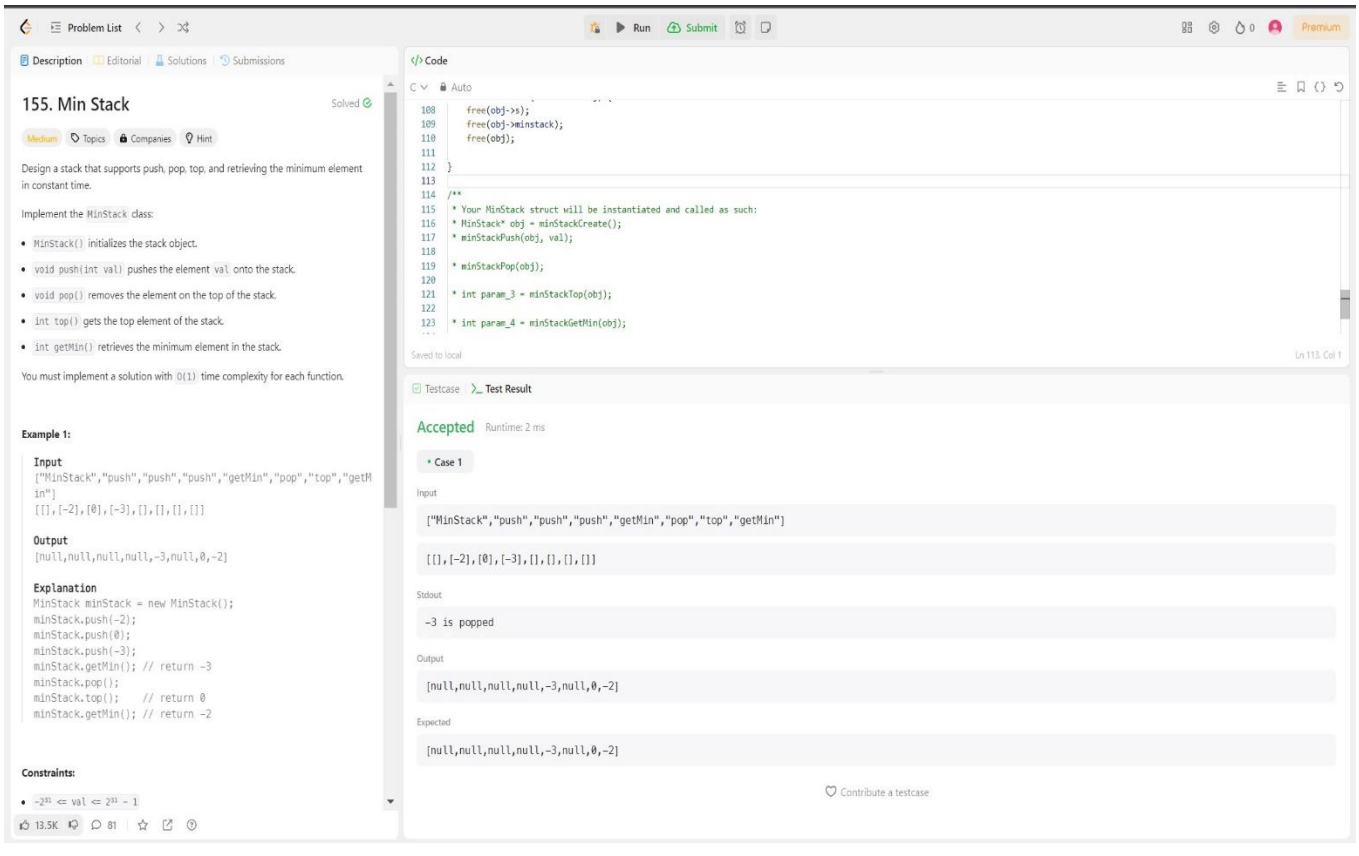
minStack.push(-3);
minStack.getMin(); // return -3
minStack.pop();
minStack.top(); // return 0
minStack.getMin(); // return -2
Constraints:
-2^31 <= val <= 2^31 - 1
13.5K
81
Auto
Saved to local
Ln 113, Col 1
Testcase
Test Result

Output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minStack.getMin(); // return -3
minStack.pop();
minStack.top(); // return 0
minStack.getMin(); // return -2
Constraints:
-2^31 <= val <= 2^31 - 1
13.5K
81
Auto
Saved to local
Ln 113, Col 1
Testcase
Test Result
Accepted
Runtime: 2 ms
Case 1
Input
["MinStack","push","push","push","getMin","pop","top","getMin"]
[[],[-2],[0],[-3],[],[],[],[]]
Stdout
-3 is popped
Output
[null,null,null,null,-3,null,0,-2]
Expected
[null,null,null,null,-3,null,0,-2]
Contribute a testcase

Code

```
typedef struct {

    int size;
    int top;
    int *s;
    int *minstack;

} MinStack;


MinStack* minStackCreate() {
    MinStack *st=(MinStack*) malloc(sizeof(MinStack));
    if(st==NULL)
    {
        printf("memory alloction failed");
        exit(0);
    }
    st->size=5;
    st->top=-1;
    st->s=(int*) malloc (st->size*sizeof(int));
    st->minstack = (int*) malloc (st->size * sizeof(int));
    if(st->s==NULL)
    {
        printf("memory allocation failed");
        free(st->s);
        free(st->minstack);
        exit(0);
    }
    return st;

}

void minStackPush(MinStack* obj, int val) {
    if(obj->top==obj->size-1)
    {
        printf("stack is overflow");

    }
    else{
        obj->top++;
        obj->s[obj->top]=val;
        if (obj->top == 0 || val < obj->minstack[obj->top - 1]) {
            obj->minstack[obj->top] = val;
        } else {
            obj->minstack[obj->top] = obj->minstack[obj->top - 1];
        }
    }


}
```

```c
void minStackPop(MinStack* obj) {
    int value;
    if(obj->top==-1)
    {
        printf("underflow");

    }
    else
    {
        value=obj->s[obj->top];
        obj->top--;
        printf("%d is popped\n",value);
    }

}

int minStackTop(MinStack* obj) {
    int value=-1;
    if(obj->top==-1)
    {
        printf("underflow\n");
        exit(0);

    }
    else
    {
        value=obj->s[obj->top];
        return value;

    }

}

int minStackGetMin(MinStack* obj) {
    if(obj->top==-1)
    {
        printf("underflow\n");
        exit(0);

    }
    else
    {
        return obj->minstack[obj->top];
    }

}

void minStackFree(MinStack* obj) {
    free(obj->s);
    free(obj->minstack);
```

```
    free(obj);

}


/**
 * Your MinStack struct will be instantiated and called as such:
 * MinStack* obj = minStackCreate();
 * minStackPush(obj, val);

 * minStackPop(obj);

 * int param_3 = minStackTop(obj);

 * int param_4 = minStackGetMin(obj);

 * minStackFree(obj);
*/
```