

AP Assignment – 6

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Ques . 1 Implement Stack using an Array

Problem link : <https://www.geeksforgeeks.org/problems/implement-stack-using-array/1>

The screenshot displays the GeeksforGeeks website interface. The browser's address bar shows the URL <https://www.geeksforgeeks.org/problems/implement-stack-using-array/1>. The page features a navigation bar with links for Courses, Tutorials, Jobs, Practice, and Contests. The main content area is divided into two sections: 'Output Window' and 'Code Editor'. The 'Output Window' on the left shows 'Compilation Results' for a submission by 'Y.O.G.I. (AI Bot)', indicating 'Problem Solved Successfully' with 1115/1115 test cases passed, 1/1 attempts correct, 100% accuracy, 1/1 points scored, and a time taken of 0.02 seconds. The 'Code Editor' on the right shows the C++ code for implementing a stack using an array. The code includes a `MyStack` class with `push` and `pop` methods. The `push` method increments the `top` pointer and adds the element to the array. The `pop` method decrements the `top` pointer and returns the element. The code is as follows:

```
27 int top;
28 public:
29     MyStack(){top=-1;}
30     int pop();
31     void push(int);
32 };
33
34
35 void MyStack ::push(int x) {
36     // Your Code
37     arr[++top]=x;
38 }
39
40
41 // Function to remove an item from top of the stack.
42 int MyStack ::pop() {
43     // Your Code
44     if(top== -1)
45         return -1;
46     return arr[top--];
47 }
48
49
50
51
52 // Driver code Ends
```

The bottom of the screenshot shows the Windows taskbar with various application icons and the system clock displaying 16:58 on 18-03-2025.

Ques . 2 Implement Queue using an Array

Problem link : <https://www.geeksforgeeks.org/problems/implement-queue-using-array/1>

The screenshot shows a web browser with the URL <https://www.geeksforgeeks.org/problems/implement-queue-using-array/1>. The page displays the 'Output Window' for a C++ solution. The 'Compilation Results' section shows 'Problem Solved Successfully' with a green checkmark. The 'Test Cases Passed' section shows '170 / 170'. The 'Attempts : Correct / Total' section shows '1 / 1'. The 'Accuracy : 100%' section shows '100%'. The 'Points Scored' section shows '1 / 1'. The 'Time Taken' section shows '0.79'. The 'Your Total Score: 98' is also displayed. The code editor on the right shows the C++ implementation of a queue using an array.

```
64 public :
65     MyQueue() {front=0; rear=0;}
66     void push(int);
67     int pop();
68 };
69
70 // Function to push an element x in a queue.
71 void MyQueue ::push(int x) {
72     arr[rear]=x;
73     rear++;
74 }
75 // Function to pop an element from queue and return that element.
76 int MyQueue ::pop() {
77     if(front==rear){
78         return -1;
79     }
80     int temp=arr[front];
81     front=(front+1)%100005;
82     return temp;
83 }
84
85
86
87
88
89
```

Ques 3 . Implement Circular Queue using an Array

Problem link:<https://leetcode.com/problems/design-circular-queue/submissions/1577854408/>

The screenshot shows a web browser with the URL <https://leetcode.com/problems/design-circular-queue/submissions/1577854408/>. The page displays the 'Accepted' status for the 'Design Circular Queue' problem. The 'Runtime' section shows '1 ms | Beats 77.18%'. The 'Memory' section shows '23.49 MB | Beats 80.08%'. The 'Test Result' section shows 'Accepted' with 'Runtime: 0 ms'. The code editor on the right shows the C++ implementation of a circular queue using an array.

```
21 MyCircularQueue(int k) {
22     // head = NULL;
23     // tail = NULL;
24     // size = k;
25
26     this->n = k;
27     arr = new int[k];
28     this->front = -1;
29     this->rear = -1;
30 }
31
32 bool enqueue(int value) {
33     // // full
34     // if (size == 0) {
35         // return false;
```

Ques 4 : Implement Two Stacks in One Array

Problem link : <https://www.geeksforgeeks.org/problems/implement-two-stacks-in-an-array/1>

The screenshot shows the GeeksforGeeks website interface. The browser tabs include 'Firewall Authentication', '(13) YouTube', 'CU-Assignments', 'Queue Using Array', 'Design Circular Queue', and 'Two Stacks in an Array'. The address bar shows the URL 'geeksforgeeks.org/problems/implement-two-stacks-in-an-array/1'. The page header includes navigation links for Courses, Tutorials, Jobs, Practice, and Contests. The main content area displays the problem details for 'Implement Two Stacks in One Array'. The 'Output Window' shows 'Problem Solved Successfully' with 'Test Cases Passed: 1111 / 1111', 'Attempts: 1 / 1', 'Accuracy: 100%', 'Points Scored: 4 / 4', and 'Time Taken: 0.05'. The 'Compilation Results' section shows 'Your Total Score: 102'. The code editor displays the following C++ code:

```
31 // Function to push an integer into the stack2.
32 void push2(int x) {
33     // code here
34     if(top2-1==top1) return;
35     top2--;
36     arr[top2]=x;
37 }
38
39 // Function to remove an element from top of the stack1.
40 int pop1() {
41     // code here
42     if(top1==0) return -1;
43     int ans=arr[top1];
44     top1--;
45     return ans;
46 }
47
48 // Function to remove an element from top of the stack2.
49 int pop2() {
50     // code here
51     if(top2==size) return -1;
52     int ans=arr[top2];
53     top2++;
54     return ans;
55 }
56
```

Ques5 : Implement queue using stack

The screenshot shows the LeetCode website interface. The browser tabs include 'Firewall Authentication', '(13) YouTube', 'CU-Assignments', 'Queue Using Array', 'Design Circular Queue', 'Two Stacks in an Array', and 'Implement Queue using Stacks'. The address bar shows the URL 'leetcode.com/problems/implement-queue-using-stacks/submissions/1577863768/'. The page header includes navigation links for Problem List, Run, Submit, and Premium. The main content area displays the problem details for 'Implement Queue using Stacks'. The 'Description' tab shows 'Accepted 22 / 22 testcases passed'. The 'Runtime' section shows '0 ms | Beats 100.00%'. The 'Memory' section shows '9.68 MB | Beats 65.84%'. The 'Code' editor displays the following C++ code:

```
13
14 public:
15     MyQueue() {}
16
17     void push(int x) {
18         in_stack.push(x);
19     }
20
21     int pop() {
22         if (out_stack.empty()) {
23             transfer();
24         }
25         int topElement = out_stack.top();
26     }

```