

DAY-4 WWC

NAME: Harsh Raj Choudhary

UID: 22BCS11231

Problem-1(Very Easy)

CODE:

```
#include <stack>

#include <iostream>

using namespace std;

class MyQueue {
private:
    stack<int> stack1;
    stack<int> stack2;

    void transferStack1ToStack2() {
        while (!stack1.empty()) {
            stack2.push(stack1.top());
            stack1.pop();
        }
    }

public:
    MyQueue() {}

    void push(int x) {
        stack1.push(x);
    }
```

```

    int pop() {        if
(stack2.empty()) {
transferStack1ToStack2();

    }

    int topElement =
stack2.top();        stack2.pop();
return topElement;

    }

```

```

    int peek() {        if
(stack2.empty()) {
transferStack1ToStack2();

    }

    return stack2.top();

    }

```

```

    bool empty() {        return stack1.empty()
&& stack2.empty();

    }

```

```

    void printQueue() {        if
(stack2.empty())        {
transferStack1ToStack2();

    }

    stack<int> temp = stack2;
stack<int> tempStack1 = stack1;

```

```

    while (!temp.empty()) {
cout << temp.top() << " ";

```

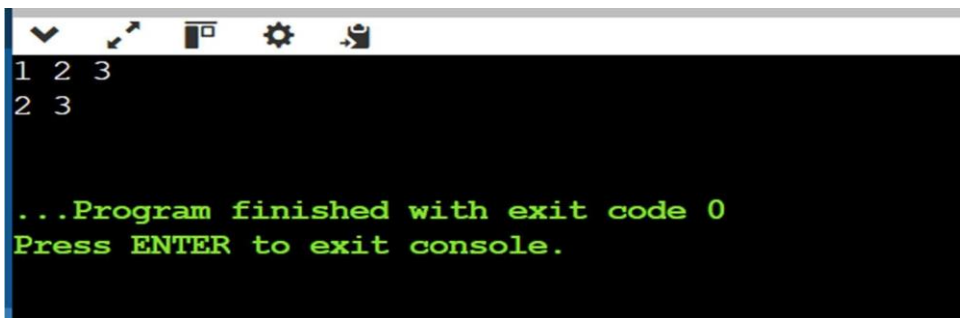
```

        temp.pop();
    }
    while (!tempStack1.empty()) {
cout << tempStack1.top() << " ";
tempStack1.pop();
    }
    cout << endl;
}
};

int main() {
    MyQueue myQueue;
    myQueue.push(1);
myQueue.push(2);
myQueue.push(3);
myQueue.printQueue();    int front
= myQueue.peek();    int popped =
myQueue.pop();
myQueue.printQueue();    bool
isEmpty = myQueue.empty();
    return 0;
}

```

OUTPUT:



```

1 2 3
2 3

...Program finished with exit code 0
Press ENTER to exit console.

```

Problem-2(Easy)

CODE:

```
#include <iostream>
```

```
#include <stack>
```

```
#include <string>
```

```
using namespace std;
```

```
string isBalanced(string s) {
```

```
    stack<char> bracketStack;
```

```
    for (char c : s) {        if (c == '('
```

```
        || c == '{' || c == '[') {
```

```
        bracketStack.push(c);
```

```
    } else {
```

```
        if (bracketStack.empty()) {
```

```
        return "NO";
```

```
    }
```

```
        char top = bracketStack.top();        if ((c == ')' && top == '(') || (c == '}'
```

```
        && top == '{') || (c == ']' && top == '[')) {        bracketStack.pop();
```

```
    } else {
```

```
        return "NO";
```

```
    }
```

```
}
```

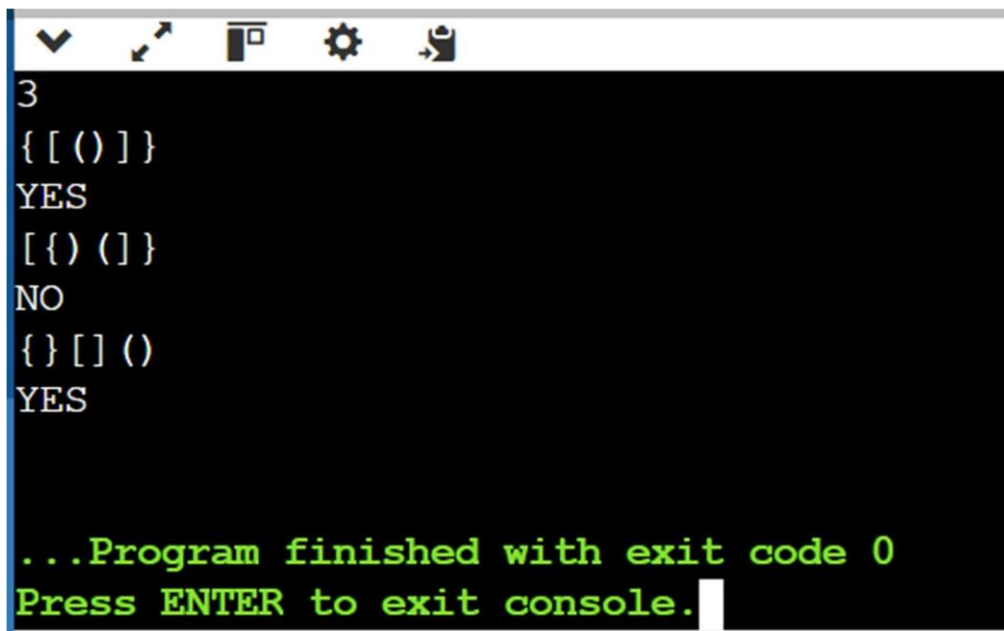
```
}
```

```
    return bracketStack.empty() ? "YES" : "NO";
```

```
}
```

```
int main() {  
    int n;    cin  
>> n;    while  
(n-->0) {  
        string s;  
        cin >> s;  
        cout << isBalanced(s) << endl;  
    }  
    return 0;  
}
```

OUTPUT:

A screenshot of a console window with a black background and white text. The window has a title bar with standard icons. The output shows three test cases for a balanced parentheses checker. The first case is '3' followed by '[(())]', which is correctly identified as 'YES'. The second case is '[{}]()', which is incorrectly identified as 'NO'. The third case is '{}[]()', which is correctly identified as 'YES'. At the bottom, a green message states '...Program finished with exit code 0' and 'Press ENTER to exit console.' with a white cursor at the end.

```
3  
{ [(()) ] }  
YES  
[ {} ] ( )  
NO  
{ } [ ] ( )  
YES  
  
...Program finished with exit code 0  
Press ENTER to exit console.
```

Problem-3(Medium)

CODE:

```
#include <vector>

#include <stack>

#include <iostream>

using namespace std;

vector<int> nextGreaterElements(vector<int>& nums) {

    int n = nums.size();

    vector<int> result(n, -1);

    stack<int> indexStack;

    for (int i = 0; i < 2 * n; ++i) {

        while (!indexStack.empty() && nums[indexStack.top()] < nums[i %

n]) {          result[indexStack.top()] = nums[i % n];

indexStack.pop();

        }

        if (i < n) {

            indexStack.push(i);

        }

    }

    return result;

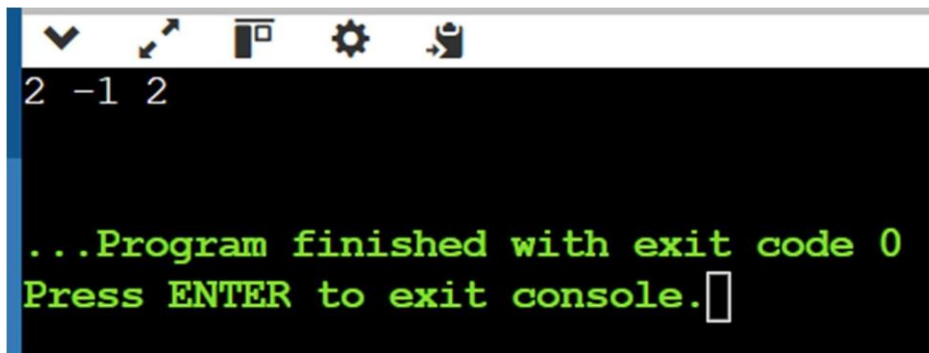
}

int main() {    vector<int> nums = {1, 2, 1};

vector<int> result = nextGreaterElements(nums);
```

```
    for (int num : result) {  
cout << num << " ";  
    }  
    cout << endl;  
  
    return 0;  
}
```

OUTPUT:



The screenshot shows a console window with a dark background and a light blue title bar. The title bar contains several icons: a checkmark, a cursor, a window icon, a gear, and a document with an arrow. The console output is as follows:

```
2 -1 2  
  
...Program finished with exit code 0  
Press ENTER to exit console.
```

Problem-4(Hard)

CODE:

```
#include <iostream>

#include <vector>

#include <deque>

using namespace std;

class DinnerPlates {
private:
    vector<deque<int>> stacks;
    int capacity;
    deque<int> le mostEmptyStack;
    int    rightmostNonEmptyStack;
public:
    DinnerPlates(int capacity) : capacity(capacity), rightmostNonEmptyStack(-1)
    {}

    void push(int val) {
        if (!le
mostEmptyStack.empty()) {
            int index
= le mostEmptyStack.front();
            le
mostEmptyStack.pop_front();
            stacks[index].push_back(val);
            if
(stacks[index].size() == capacity) {
                rightmostNonEmptyStack = max(rightmostNonEmptyStack, index);
            }
        } else {
            stacks.push_back({val});
            le
mostEmptyStack.push_back(stacks.size() - 1);

            rightmostNonEmptyStack = max(rightmostNonEmptyStack,
sta c_cast<int>(stacks.size() - 1));
        }
    }
};
```



```

    }

    int pop() {
        if (rightmostNonEmptyStack == -1) return -1;
        int val = stacks[rightmostNonEmptyStack].back();
        stacks[rightmostNonEmptyStack].pop_back();
        if (stacks[rightmostNonEmptyStack].empty()) {
            rightmostNonEmptyStack--;
        }
        if (stacks[rightmostNonEmptyStack].size() < capacity) {
            le mostEmptyStack.push_back(rightmostNonEmptyStack);
        }
        return val;
    }

    int popAtStack(int index) {
        if (index < 0 || index >=
stacks.size() || stacks[index].empty()) {
            return -1;
        }
        int val = stacks[index].back();
        stacks[index].pop_back();

        if (stacks[index].empty()) {
            le mostEmptyStack.push_back(index);
        }
        return val;
    }
};

int main() {
    DinnerPlates dp(2);

```

```

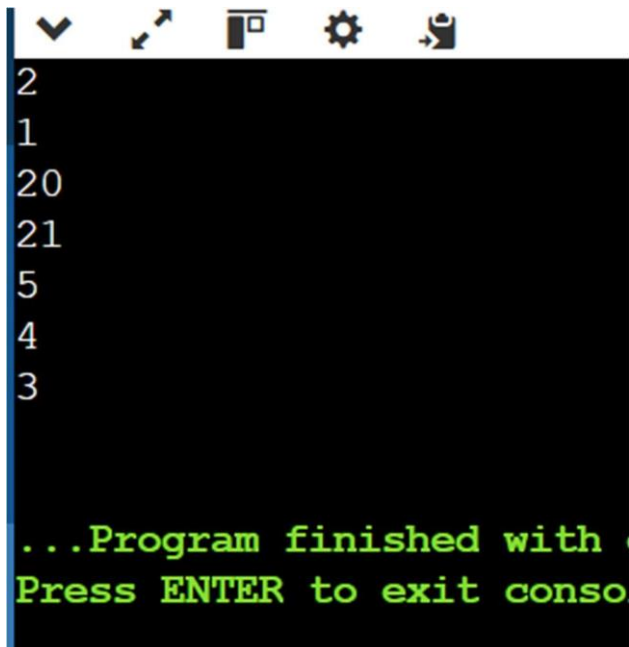
dp.push(1);
dp.push(2);

    dp.push(3);    dp.push(4);
dp.push(5);    cout <<
dp.popAtStack(0) << endl;
dp.push(20);    dp.push(21);
cout << dp.popAtStack(0) << endl;
cout << dp.popAtStack(2) << endl;
cout << dp.pop() << endl;    cout
<< dp.pop() << endl;    cout <<
dp.pop() << endl;    cout <<
dp.pop() << endl;

    return 0;
}

```

OUTPUT:



```

2
1
20
21
5
4
3

...Program finished with ...
Press ENTER to exit console

```

Problem-5(VeryHard)

CODE:

```
#include <iostream>
```

```
#include <vector>
```

```
#include <algorithm>
```

```
#include <numeric>
```

```
using namespace std;
```

```
vector<int> gcdPairs(vector<int>& nums, vector<int>& queries) {
```

```
vector<int> gcdPairs;
```

```
    int n = nums.size();
```

```
    for (int i = 0; i < n; i++) {
```

```
    for (int j = i + 1; j < n; j++) {
```

```
        gcdPairs.push_back(gcd(nums[i], nums[j]));
```

```
    }
```

```
}
```

```
sort(gcdPairs.begin(), gcdPairs.end());
```

```
vector<int> result;    for (int query :  
queries) {
```

```
result.push_back(gcdPairs[query]);
```


```
}
```

```
return result;
```

```
}
```

```
int main() {  
    vector<int> nums1 = {2, 3, 4};    vector<int>  
queries1 = {0, 2, 2};    vector<int> result1 =  
gcdPairs(nums1, queries1);  
  
    cout << "Result for Test Case 1: ";  
    for (int val : result1) {  
cout << val << " ";  
    }  
    cout << endl;  
  
    vector<int> nums2 = {4, 4, 2, 1};  
vector<int> queries2 = {5, 3, 1, 0};    vector<int>  
result2 = gcdPairs(nums2, queries2);  
  
    cout << "Result for Test Case 2: ";  
    for (int val : result2) {  
cout << val << " ";  
    }  
    cout << endl;  
    return 0;  
}
```

OUTPUT:



```
Result for Test Case 1: 1 2 2
Result for Test Case 2: 4 2 1 1

...Program finished with exit code 0
Press ENTER to exit console.█
```