DAY-4 WWC

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Problem-1(Very Easy)

CODE:

```cpp
#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);
  }
```

```cpp
    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() << " ";
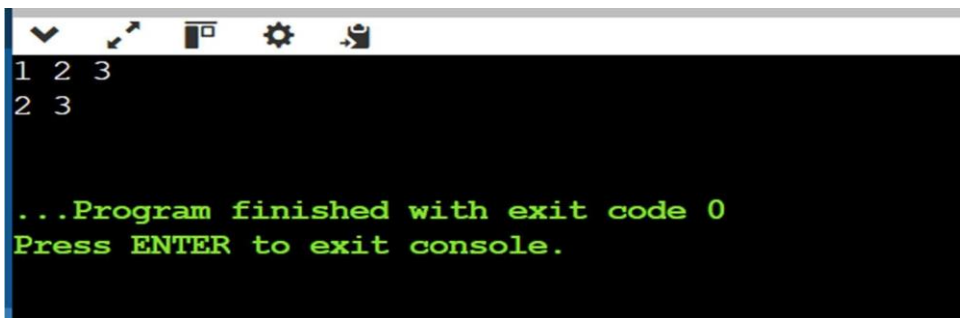```

```cpp
            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:

```cpp
#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";

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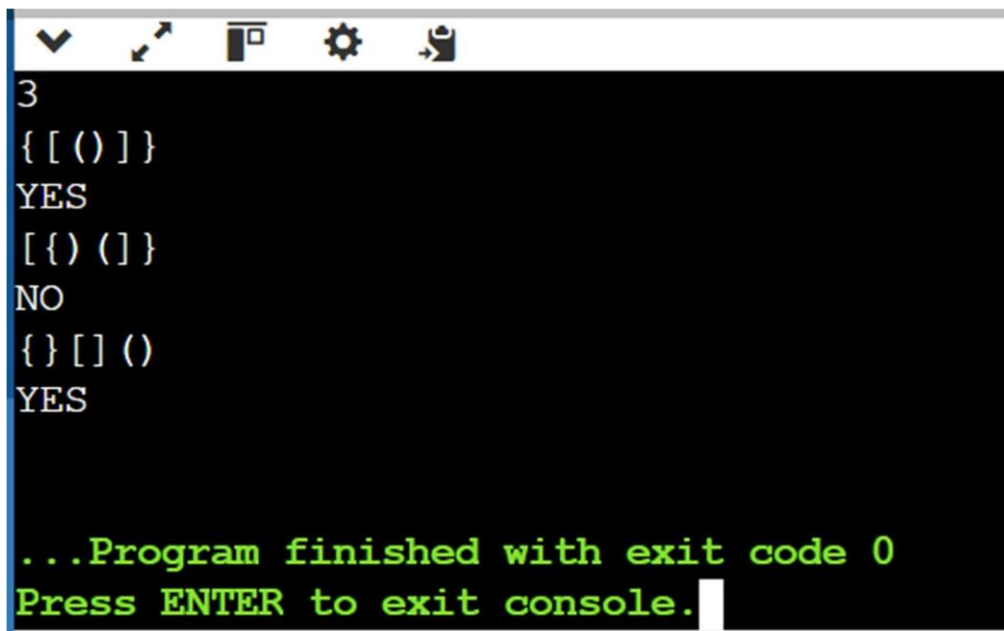
```cpp
int main() {
    int n;    cin
>> n;    while
(n--) {
        string s;
cin >> s;
        cout << isBalanced(s) << endl;
    }
    return 0;
}
```

OUTPUT:


```
3
{[()]}
YES
[{)(]}
NO
{}[]()
YES


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

Problem-3(Medium)

CODE:

```cpp
#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);
```
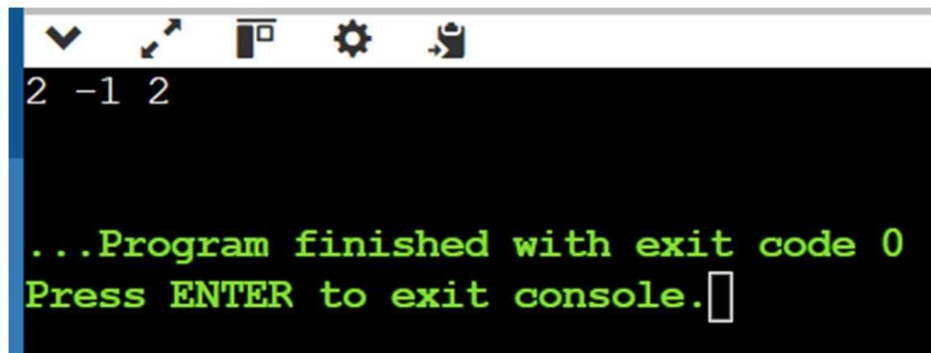
```cpp
    for (int num : result) {
cout << num << " ";
    }
    cout << endl;


    return 0;
}
```

OUTPUT:


```
2 -1 2


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

Problem-4(Hard)

CODE:

```cpp
#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));

    }
```

```cpp
    }
    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);
```
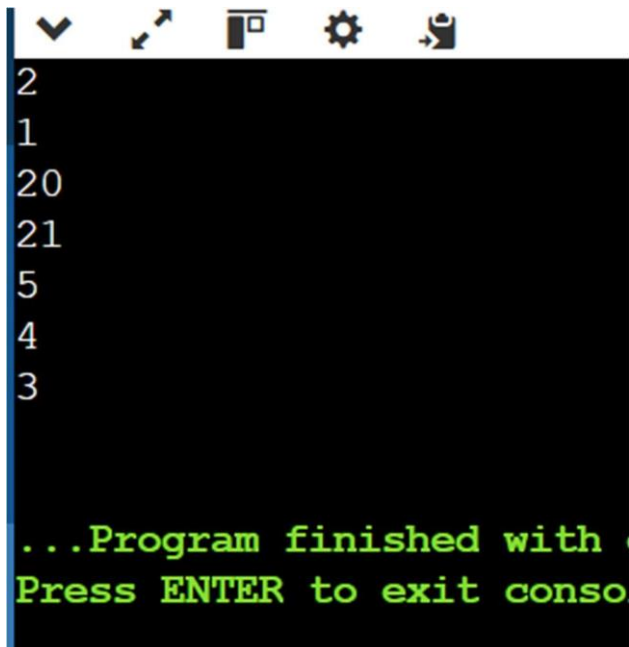
```
dp.push(1);

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:

Problem-5(Very Hard)

CODE:

```cpp
#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;
}
```

```cpp
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.
```