

1. PROGRAM:

```
import java.util.*;

public class Main {
    public static String removeDuplicates(String s) {
        Stack<Character> stack = new Stack<>();
        for (char ch : s.toCharArray()) {
            if (!stack.isEmpty() && stack.peek() == ch) {
                stack.pop();
            } else {
                stack.push(ch);
            }
        }

        StringBuilder result = new StringBuilder();
        for (char ch : stack) {
            result.append(ch);
        }

        return result.toString();
    }

    public static void main(String[] args) {
        String input = "abbaca";
        String output = removeDuplicates(input);
        System.out.println("Output: " + output);
    }
}
```

2. PROGRAM

```
import java.util.*;

public class StockSpan {
    public static int[] calculateSpan(int[] price) {
        int n = price.length;
        int[] span = new int[n];
        Stack<Integer> stack = new Stack<>();
```

```

        for (int i = 0; i < n; i++) {
            while (!stack.isEmpty() && price[stack.peek()] <= price[i]) {
                stack.pop();
            }

            span[i] = stack.isEmpty() ? (i + 1) : (i - stack.peek());

            stack.push(i);
        }

        return span;
    }

    public static void main(String[] args) {
        int[] price = { 100, 80, 60, 70, 60, 75, 85 };
        int[] span = calculateSpan(price);

        System.out.println("Stock Spans:");
        for (int s : span) {
            System.out.print(s + " ");
        }
    }
}

```

3. PROGRAM

```
import java.util.Stack;
```

```
public class Main {
```

```
    public static boolean isBalanced(String str) {
        Stack<Character> stack = new Stack<>();
```

```
        for (char ch : str.toCharArray()) {
```

```
            if (ch == '(' || ch == '{' || ch == '[') {
                stack.push(ch);
            }
```

```
            else if (ch == ')' || ch == '}' || ch == ']') {
                if (stack.isEmpty()) return false;
```

```

        char top = stack.pop();
        if ((ch == ')' && top != '(') ||
            (ch == '}' && top != '{') ||
            (ch == ']' && top != '[')) {
            return false;
        }
    }
}

return stack.isEmpty();
}

public static void main(String[] args) {
    String input1 = "((()))";
    String input2 = "()";
    System.out.println(input1 + " → " + (isBalanced(input1) ?
"Balanced" : "Not Balanced"));
    System.out.println(input2 + " → " + (isBalanced(input2) ?
"Balanced" : "Not Balanced"));
}

```