JAVA PROGRAM

DAY 13:ASSIGNMENT

1. PROGRAM:

```java
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

```java
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<>();
```

```java
        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

```java
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;
```

```java
                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"));

}
```