Solution 16-11-23

22. Generate Parentheses

```
import java.util.ArrayList;
import java.util.List;
import java.util.Scanner;

public class GenerateParentheses {

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter the number of pairs of parentheses: ");
        int n = scanner.nextInt();

        List<String> result = generateParenthesis(n);

        System.out.println("Valid Parentheses Combinations:");
        for (String combination : result) {
            System.out.println(combination);
        }
    }

    public static List<String> generateParenthesis(int n) {
        List<String> result = new ArrayList<>();
        generateParenthesisHelper(result, "", 0, 0, n);
        return result;
    }

    private static void generateParenthesisHelper(List<String> result, String current, int open, int close,
int max) {
```

```
        if (current.length() == max * 2) {
            result.add(current);
            return;
        }

        if (open < max) {
            generateParenthesisHelper(result, current + "(", open + 1, close, max);
        }

        if (close < open) {
            generateParenthesisHelper(result, current + ")", open, close + 1, max);
        }
    }
}
```

Output:-

```
java -cp /tmp/bwugx1sriT GenerateParentheses
Enter the number of pairs of parentheses: 3
Valid Parentheses Combinations:
((()))
(()())
(())()
()(())
()()()
```

136. Single Number

```
import java.util.Scanner;

public class SingleNumber {

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter the number of elements in the array: ");
        int n = scanner.nextInt();

        int[] nums = new int[n];

        System.out.println("Enter the elements of the array:");
        for (int i = 0; i < n; i++) {
            nums[i] = scanner.nextInt();
        }

        int result = singleNumber(nums);

        System.out.println("The single number is: " + result);
    }

    public static int singleNumber(int[] nums) {
        int result = 0;

        // Using XOR operation to find the single number
        for (int num : nums) {
            result ^= num;
        }
```

```
        return result;
    }
}
```

Output:-

```
java -cp /tmp/KUc9URWOBS SingleNumber
Enter the number of elements in the array: 3
Enter the elements of the array:
2
2
1
The single number is: 1
```