All practice problems:

1. Write a Java program to calculate the area of a Quadrangular:

```
package Practice_problem_2;

import java.util.Scanner;

public class Quadrangular {
    public void Squre(int x) {
        int p = x * x;
        System.out.println("The area of a the square is: \n " + "("+x+")^2 \n ="+ p +
 " unit square");

    }
    public void Rectangle(int x,int y) {
        int p = x * y;
        System.out.println("The area of a the Rectangle is: \n " + "("+x+"x"+y+") \n
 ="+ p + " unit square");

    }
    public void Parallelogram(int x,int y) {
        int p = x * y;
        System.out.println("The area of a the Parallelogram is: \n " + "("+x+"x"+y+")
 \n ="+ p + " unit square");

    }
    public void Rhombus(int x,int y) {
        float p = (float) (.5 * x * y);
        System.out.println("The area of a the Rhombus is: \n " + ".5x"+x+"x"+y+" \n
 ="+ p + " unit square");

    }
    public void Trapezium(int x,int y, int z) {
        float p = (float) (.5 * (x + y) * z);
        System.out.println("The area of a the Trapezium is: \n " + ".5x("+x+"+"+y+")
x"+z+" \n ="+ p + " unit square");

    }
    public void Kite(int x,int y) {
        float p = (float) (.5 * x * y);
        System.out.println("The area of a the Kite is: \n " + ".5x"+x+"x"+y+" \n ="+ p
+ " unit square");

    }
    public static void main(String[] args) {
        Quadrangular qua = new Quadrangular();
        Scanner ss = new Scanner(System.in);
        System.out.print("What type of Quadrangular's area do you want to calculate?
 \n 1.Square \n 2.Rectangle \n 3.Parallelogram \n 4.Rhombus \n 5.Trapezium \n 6.Kite
 \n Type a number which you want:");
```

```
        int p = ss.nextInt();
while (p != 1 && p != 2 && p != 3 && p != 4 && p != 5 && p != 6) {
    System.out.println("Error value. \nYOU HAVE TO PUT FROM 1 TO 6..... ");
    System.out.print("What type of Quadrangular's area do you want to calculate? \n 1.
Square \n 2.Rectangle \n 3.Parallelogram \n 4.Rhombus \n 5.Trapezium \n 6.Kite \n Type
a number which you want:");
    p = ss.nextInt();
}
        if (p==1){
            System.out.println("You have chosen Square for counting area... \n put a s
ide of square:");
            int x = ss.nextInt();
            qua.Squre(x);
        } else if (p==2){
            System.out.println("You have chosen Rectangle for counting area... \n put
 the height of the Rectangle:");
            int x = ss.nextInt();
            System.out.println("put the width of the Rectangle:");
            int y = ss.nextInt();
            qua.Rectangle(x,y);
        } else if (p==3){
            System.out.println("You have chosen Parallelogram for counting area... \n
 put the base of the Parallelogram:");
            int x = ss.nextInt();
            System.out.println("put the height of the Parallelogram:");
            int y = ss.nextInt();
            qua.Parallelogram(x,y);
        } else if (p==4){
            System.out.println("You have chosen Rhombus for counting area... \n put a
 diagonal of the Rhombus:");
            int x = ss.nextInt();
            System.out.println("put the other diagonal of the Rhombus:");
            int y = ss.nextInt();
            qua.Rhombus(x,y);
        } else if (p==5){
            System.out.println("You have chosen Trapezium for counting area... \n put
 a length of a parallel side  of the Trapezium:");
            int x = ss.nextInt();
            System.out.println("put the length of other parallel side of the Trapeziu
m: ");
            int y = ss.nextInt();
            System.out.println("Put the distance of these parallel sides:");
            int z = ss.nextInt();
            qua.Trapezium(x,y,z);
        } else if (p==6){
            System.out.println("You have chosen Kite for counting area... \n put a dia
gonal of the Kite:");
            int x = ss.nextInt();
            System.out.println("put the other diagonal of the Kite:");
            int y = ss.nextInt();
            qua.Kite(x,y);
        }
    }
}
```

Output :

```
What type of Quadrangular's area do you want to calculate?
 1.Square
 2.Rectangle
 3.Parallelogram
 4.Rhombus
 5.Trapezium
 6.Kite
 Type a number which you want:5
You have chosen Trapezium for counting area...
 put a length of a parallel side  of the Trapezium:
5
put the length of other parallel side of the Trapezium:
4
Put the distance of these parallel sides:
7
The area of a the Trapezium is:
 .5x(5+4)x7
 =31.5 unit square

Process finished with exit code 0
```

2. Write a Java program to check if a number is even or odd.

```
package Practice_problem_2;

import java.util.Scanner;

public class CheckOddEven {
   public void num(int x){
       if (x%2 ==0){
           System.out.println("This is Even");
       } else {
           System.out.println("This is Odd");
       }
   }

    public static void main(String[] args) {
        CheckOddEven c = new CheckOddEven();
        Scanner s = new Scanner(System.in);
        for ( ; ; ){
        System.out.println("Enter a number:");
        int n = s.nextInt();
        c.num(n);
    }
   }
}
```

Output:

```
"C:\Program Files\Java\jdk1.8.0_181\bin\java.exe"

Enter a number:
7
This is Odd
Enter a number:
5
This is Odd
Enter a number:
8
This is Even
Enter a number:
4
This is Even
Enter a number:
56
This is Even
Enter a number:
```

3. Write a Java program to find the factorial of a number.

```
package Practice_problem_2;

import java.util.Scanner;

public class Factorial {
        public void fact(int x){
            int mul = 1;

            while (  x>=1) {
                mul = mul * x;
                x--;

            }
            System.out.println(" The factorial value is : " + mul );

        }

        public static void main(String[] args) {
            Factorial pm = new Factorial();
            Scanner sc = new Scanner(System.in);
            System.out.println(" Enter any number: ");
            int sp = sc.nextInt();
            pm.fact(sp);
        }
    }
```

Output:

```
Enter any number:
5
 The factorial value is : 120

Process finished with exit code 0
```

4. Write a Java program to swap two numbers without using a temporary variable.

```
package Practice_problem_2;

import javax.script.ScriptContext;
import java.util.Scanner;

public class SwappingTwoNumbers {
    public void nums(int x, int y){
        x= x+y;
        y=x-y;
        x=x-y;
        System.out.println("The Swapping value is: \nSwapping first value, A: " +x+"\n
Swapping Second value, B: " +y);
    }

    public static void main(String[] args) {
        SwappingTwoNumbers STN = new SwappingTwoNumbers();
        Scanner ss = new Scanner(System.in);
        System.out.print("Enter the first value A: ");
        int a = ss.nextInt();
        System.out.print("Enter the second value B: ");
        int b = ss.nextInt();
        STN.nums(a,b);

    }
}
```

Output:

```
Enter the first value A:66
Enter the second value B:77
The Swapping value is:
Swapping first value, A: 77
Swapping Second value, B: 66

Process finished with exit code 0
```

5. Write a Java program to find the sum of natural numbers up to a given limit.

```
package Practice_problem_2;

import java.util.Scanner;

public class Summation {
    public void summation(int x){
        int sum=0;
        while(x>=0){
            sum=sum+x;
            x--;
        }
        System.out.println("the total summation of natural num of your given limit is:
" +sum);
    }

    public static void main(String[] args) {
        Summation sm = new Summation();
        Scanner ss = new Scanner(System.in);
        System.out.print("Enter the limit of your summation: ");
        int s=ss.nextInt();
        sm.summation(s);

    }
}
```

Output:

```
Enter the limit of your summation: 8
the total summation of natural num of your given limit is: 36

Process finished with exit code 0
```

6. Write a Java program to check if a given year is a leap year.

```
package Practice_problem_2;
import java.util.Scanner;

public class LeapYear {
    public void  leapyear(int year) {
```

```
        boolean isLeapYear = (year % 400 == 0) || ((year % 4 == 0) && (year % 100 !=
 0));
        if (isLeapYear) {
            System.out.println("The year is a leap year.");
        } else {
            System.out.println("The year is not a leap year.");
        }
    }

        public static void main(String[] args) {
            LeapYear LY = new LeapYear();
            Scanner scanner = new Scanner(System.in);
            System.out.print("Enter a year: ");
            int year = scanner.nextInt();
            LY.leapyear(year);

        }
    }
```

Output:

```
Enter a year: 1700
The year is not a leap year.

Process finished with exit code 0
```

7. Write a Java program to find the maximum number among three given numbers.

```
package Practice_problem_2;

import java.util.Scanner;

public class MaxNum {
    public void max(int x, int y, int z){
        if(x>y && x>z){
            System.out.println("The Maximum num is : " +x);
        } else if (x>y && x<z) {
            System.out.println("The Maximum num is : " +z);
        } else {
            System.out.println("The Maximum num is : " +y);
        }
    }

    public static void main(String[] args) {
        MaxNum m = new MaxNum();
        Scanner s = new Scanner(System.in);
        System.out.println("input the first num:");
```

```
        int k = s.nextInt();
        System.out.println("input the Second num:");
        int l = s.nextInt();
        System.out.println("input the Third num:");
        int n = s.nextInt();
        m.max(k,l,n);
    }
}
```

Output:

```
input the first num:
5
input the Second num:
2
input the Third num:
8
The Maximum num is :8

Process finished with exit code 0
```

8. Write a Java program to check if a given string is a palindrome.

```
package Practice_problem_2;


import java.util.Scanner;

public class Palindrom {
    //public void pal (String s){
    public static boolean  pal(String s ){

        int left = 0 ;
        int right = s.length()-1;
        while( left<right){
            if (s.charAt(left) != s.charAt(right)){
                return false;
            }
            left++;
            right--;
        }
        return true;

    }

    public static void main(String[] args) {
```

```
        Palindrom pm = new Palindrom();
        Scanner sc = new Scanner(System.in);
        for ( ; ; ) {
            System.out.println("Enter the word: ");
            String ss = sc.nextLine();
            pm.pal(ss);
            if (pal(ss)){
                System.out.println( ss  + " : This is palindrom");
            }
            else {
                System.out.println(ss + ": This is not palindrom");
            }
        }
    }
}
```

output:

```
Enter the word:
abba
abba : This is palindrom
Enter the word:
kaka
kaka: This is not palindrom
Enter the word:
kaak
kaak : This is palindrom/
```

9. Write a Java program to calculate the average of numbers in an array.

```
package Practice_problem_2;

import java.lang.reflect.Array;
import java.util.Arrays;
import java.util.Scanner;

public class Avg_num {
public void ar(int [] a){
    int l = a.length;
    float sum =0;
    for (int i=0;i<l;i++){
        sum=sum+a[i];
    }
    float p = sum/l;
    System.out.println("the average vaule of the array is:"  + p );
}

    public static void main(String[] args) {
        Avg_num avn= new Avg_num();
```

```
        Scanner s = new Scanner(System.in);
        System.out.println("input the length of the array:");
        int l =s.nextInt();
        int[] a = new int[l];
        for(int i=0;i<l;i++){
            System.out.println("input the value for:" +(i+1));
            int v =s.nextInt();
            a[i]=v;
        }
        System.out.println("the array is :"+Arrays.toString(a));
        avn.ar(a);


    }
}
```

output:

```
input the length of the array:
5
input the value for:1
2
input the value for:2
3
input the value for:3
4
input the value for:4
5
input the value for:5
6
the array is :[2, 3, 4, 5, 6]
the average vaule of the array is:4.0

Process finished with exit code 0
```

10.Write a Java program to check if two strings are anagrams

```
package Practice_problem_2;

public class anagrams {

    public static void main(String[] args) {
        String str1 = "hello";
        String str2 = "olleh";

        boolean ana =isAnagram(str1, str2);

        if (ana) {
            System.out.println("The strings are anagrams.");
```

```
        } else {
            System.out.println("The strings are not anagrams.");
        }
    }

    private static boolean isAnagram(String str1, String str2) {
        if (str1.length() != str2.length()) {
            return false;
        }

        int[] charCount = new int[256];

        for (int i = 0; i < str1.length(); i++) {
            char ch = str1.charAt(i);
            System.out.println(ch);
            charCount[ch]++;
            System.out.println(charCount[ch]);
        }

        for (int i = 0; i < str2.length(); i++) {
            char ch = str2.charAt(i);
            System.out.println(ch);
            charCount[ch]--;
            System.out.println(charCount[ch]);
        }

        for (int i = 0; i < 256; i++) {
            if (charCount[i] != 0) {
                return false;
            }
        }

        return true;
    }
}
```

Output:

```
The strings are anagrams.
```

OR,

```
package Practice_problem_2;

import java.util.Arrays;
import java.util.Scanner;

public class Anagram {
    public void anagram(String a, String b){
        a = a.toLowerCase();
```

```
        b = b.toLowerCase();

        // check if length is same
        if(a.length() == b.length()) {

            // convert strings to char array
            char[] charArray1 = a.toCharArray();
            char[] charArray2 = b.toCharArray();
            System.out.println("Tha arrays of these words are:\n1."+ Arrays.toString(c
harArray1)+"\n2."+Arrays.toString(charArray2) );
            // sort the char array
            Arrays.sort(charArray1);
            System.out.println("by sorting 1st array:" + Arrays.toString(charArray1));
            Arrays.sort(charArray2);
            System.out.println("by sorting 1st array:" + Arrays.toString(charArray2));
            boolean result = Arrays.equals(charArray1, charArray2);

            if(result) {
                System.out.println(a + " and " + b + " are anagram.");
            }
            else {
                System.out.println(a + " and " + b + " are not anagram.");
            }
        }

    }

    public static void main(String[] args) {
        Anagram ang = new Anagram();
        Scanner ss = new Scanner(System.in);
        System.out.println("type the first Word:");
        String a = ss.nextLine();
        System.out.println("Type the second Word:");
        String b = ss.nextLine();
        ang.anagram(a,b);

    }


    }
```

Output:

```
type the first Word:
listen
Type the second Word:
silent
Tha arrays are:
1.[l, i, s, t, e, n]
2.[s, i, l, e, n, t]
by sorting 1st array:[e, i, l, n, s, t]
by sorting 1st array:[e, i, l, n, s, t]
listen and silent are anagram.
```

```
Process finished with exit code 0
```

11. Write a Java program to count the occurrence of a character in a string.

```
package Practice_problem_2;

import javax.script.ScriptContext;
import java.util.Scanner;

public class CharacterOccurrence {
    public void occ(String s, char c){
        int count=0;
        int n=s.length();
        for (int i = 0; i<n; i++){
            if(c == s.charAt(i)){
                count++;
            }
        }
        System.out.println(c + " is "+ count+ " times in the word");
    }

    public static void main(String[] args) {
        CharacterOccurrence co = new CharacterOccurrence();
        Scanner ss = new Scanner(System.in);
        System.out.println("Input a word:");
        String s= ss.nextLine();
        System.out.println("which letter do you want to count:");
        char c = ss.next().charAt(0);
        co.occ(s,c);
    }
}
```

output:

```
Input a word:
banana
which letter do you want to count:
n
n is 2 times in the word

Process finished with exit code 0
```

12. Write a Java program to find the power of a number:

```
package Practice_problem_2;

import java.util.Scanner;

public class PowerOFaNumber {
    public void power(int exponent , int b){
        long power = 1;
        for (int i = 0; i < exponent; i++) {
            power *= b;
        }

        System.out.println(b + " to the power of " + exponent + " is " + power);
    }

    public static void main(String[] args) {

        PowerOFaNumber pw = new PowerOFaNumber();
        Scanner s = new Scanner(System.in);
        System.out.println("input the exponent:");
        int e = s.nextInt();
        System.out.println("input the base:");
        int b = s.nextInt();
        pw.power(e,b);
    }
}
```

output:

```
input the exponent:
3
input the base:
2
2 to the power of 3 is 8

Process finished with exit code 0
```

13. Write a Java program to find the frequency of elements in an array:

```
package Practice_problem_2;

import java.util.Arrays;
import java.util.HashMap;
import java.util.Map;
```

```
import java.util.Scanner;

public class FrequencyOfElements {
    public void frequency(int [] array){
        Map<Integer, Integer> freq = new HashMap<>();
        for (int element : array) {
            if (freq.containsKey(element)) {
                freq.put(element, freq.get(element) + 1);
            } else {
                freq.put(element, 1);
            }
        }

        // Print the frequency of each element.
        System.out.println("The frequency of each element is:");
        for (Map.Entry<Integer, Integer> entry : freq.entrySet()) {
            System.out.println(entry.getKey() + " : " + entry.getValue());
        }
    }

    public static void main(String[] args) {
        FrequencyOfElements fe = new FrequencyOfElements();
        Scanner ss = new Scanner(System.in);
        System.out.println("input the range of your array:");
        int n = ss.nextInt();
        int [] array = new int[n];
        for (int x = 0 ; x<=n-1; x++){
            System.out.println("input the value for " + x + " :");
            int p = ss.nextInt();
            array[x]=p;
        }
        System.out.println("the array is : " + Arrays.toString(array));
        fe.frequency(array);
    }
}
```

output:

```
input the range of your array:
5
input the value for 0 :
1
input the value for 1 :
3
input the value for 2 :
4
input the value for 3 :
2
input the value for 4 :
2
the array is : [1, 3, 4, 2, 2]
The frequency of each element is:
1 : 1
2 : 2
```

```
3 : 1
4 : 1

Process finished with exit code 0
```

14. Write a Java program to find the second smallest element in an array

```
package Practice_problem_2;

import java.util.Arrays;
import java.util.Scanner;

public class SecondSmallestElement {
    public void small(int[] ary) {
        int n = ary.length;
        int temp = 0;
        for (int i = 0; i < n; i++) {
            for (int j = 1; j < (n - i); j++) {
                if (ary[j - 1] > ary[j]) {
                    temp = ary[j];
                    ary[j] = ary[j - 1];
                    ary[j - 1] = temp;
                }
            }
        }
        System.out.println("the  rearrange array is : " + Arrays.toString(ary));
        System.out.println("the Second smallest element is:" + ary[1]);
    }

    public static void main(String[] args) {
        SecondSmallestElement s = new SecondSmallestElement();
        Scanner ss = new Scanner(System.in);
        System.out.println(" input the range of your array:");
        int n = ss.nextInt();
        int [] array = new int[n];
        for (int x = 0 ; x<=n-1; x++){
            System.out.println("input the value for " + x + " :");
            int p = ss.nextInt();
            array[x]=p;
        }
        System.out.println("the array is : " + Arrays.toString(array));
        s.small(array);
    }
    }
```

or,

```
package Practice_problem_2;

import java.util.Arrays;
import java.util.Scanner;

public class Secondsmallestarrays {
    public void small(int [] ary){
        Arrays.sort(ary);
        System.out.println("the  rearrange array is : " + Arrays.toString(ary));
        System.out.println("the Second smallest element is:" + ary[1]);
    }
    public static void main(String[] args) {
        SecondSmallestElement s = new SecondSmallestElement();
        Scanner ss = new Scanner(System.in);
        System.out.println(" input the range of your array:");
        int n = ss.nextInt();
        int [] array = new int[n];
        for (int x = 0 ; x<=n-1; x++){
            System.out.println("input the value for " + x + " :");
            int p = ss.nextInt();
            array[x]=p;
        }
        System.out.println("the array is : " + Arrays.toString(array));
        s.small(array);
    }
}
```

output:

```
input the range of your array:
5
input the value for 0 :
3
input the value for 1 :
6
input the value for 2 :
9
input the value for 3 :
8
input the value for 4 :
4
the array is : [3, 6, 9, 8, 4]
the  rearrange array is : [3, 4, 6, 8, 9]
the Second smallest element is:4

Process finished with exit code 0
```

15. Write a Java program to find the maximum difference between two elements in an array.

```
package Practice_problem_2;

import java.util.Arrays;
import java.util.Scanner;

import static jdk.nashorn.internal.objects.NativeMath.abs;
import static sun.util.calendar.CalendarUtils.mod;

public class Max_Diff {
    public void small(int [] ary){
        Arrays.sort(ary);
        System.out.println("the  rearrange array is : " + Arrays.toString(ary));
        int l = ary.length;
        int diff =0;
        int p=0;
        int a=0;
        int b=0;
        for (int i=0;i<l-1;i++){
            p= (Math.abs(ary[i+1]-ary[i]));
            if(diff<p){
                diff=p;
                 a = ary[i+1];
                 b = ary[i];
            }
        }
        System.out.println("the highest difference is: "  + diff+ ".\nwhich is betwee
n: "+a+ " and "+b );
    }
    public static void main(String[] args) {
        Max_Diff s = new Max_Diff();
        Scanner ss = new Scanner(System.in);
        System.out.println(" input the range of your array:");
        int n = ss.nextInt();
        int [] array = new int[n];
        for (int x = 0 ; x<=n-1; x++){
            System.out.println("input the value for " + x + " :");
            int p = ss.nextInt();
            array[x]=p;
        }
        System.out.println("the array is : " + Arrays.toString(array));
        s.small(array);
    }
}
```

Output:

```
"C:\Program Files\Java\jdk1.8.0_181\bin\java.exe" "-" Practice_problem_2.Max_Diff
input the range of your array:
5
input the value for 0 :
1
input the value for 1 :
5
```

```
input the value for 2 :
6
input the value for 3 :
4
input the value for 4 :
3
the array is : [1, 5, 6, 4, 3]
the  rearrange array is : [1, 3, 4, 5, 6]
the highest difference is: 2.
which is between: 3 and 1

Process finished with exit code 0
```

16.Write a Java program to rotate an array to the right by k positions:

```
package Practice_problem_2;

import java.util.Arrays;
import java.util.Scanner;

public class RotateanArray {
    public void rotate(int[] array, int k) {
        int len = array.length;
        int[] temp = new int[k];
        for (int i = 0; i < k; i++) {
            temp[i] = array[i];
        }
        for (int i = k; i < len; i++) {
            array[i - k] = array[i];
        }
        for (int i = 0; i < k; i++) {
            array[len - k + i] = temp[i];
        }
        System.out.println("the array is:" + Arrays.toString(array));

    }

    public static void main(String[] args) {
        RotateanArray r = new RotateanArray();
        Scanner ss = new Scanner(System.in);
        System.out.println(" input the range of your array:");
        int n = ss.nextInt();
        int [] array = new int[n];
        for (int x = 0 ; x<=n-1; x++){
            System.out.println("input the value for " + x + " :");
            int p = ss.nextInt();
            array[x]=p;
        }
        System.out.println("the array is : " + Arrays.toString(array));
        System.out.println("input a value from where you want to break:");
```

```
        int k =ss.nextInt();
        r.rotate(array,k);
    }
}
```

output:

```
input the range of your array:
5
input the value for 0 :
1
input the value for 1 :
2
input the value for 2 :
3
input the value for 3 :
4
input the value for 4 :
5
the array is : [1, 2, 3, 4, 5]
input a value from where you want to break:
3
the array is:[4, 5, 1, 2, 3]

Process finished with exit code 0
```

17. Write a Java program to find the sum of two numbers in a sorted array such that it equals a given target sum.

```
package Practice_problem_2;

import java.util.Arrays;
import java.util.Scanner;

public class SumFinding {
    public void array(int[] ary, int sum) {
        int n = ary.length;
        int temp = 0;
        Arrays.sort(ary);
        System.out.println("the  rearrange array is : " + Arrays.toString(ary));
        for (int i = 0; i < n-1; i++) {
            for (int j = i+1; j <= n-1; j++) {
                temp = (ary[i] + ary[j]);
                if (temp == sum){
                    System.out.println("from this array the sum of " +ary[i]+ " and "+
ary[j]+" is equal to your given value "+sum );
                }
            }
```

```
            }
        }

    public static void main(String[] args) {
        SumFinding s = new SumFinding();
        Scanner ss = new Scanner(System.in);
        System.out.println(" input the range of your array:");
        int n = ss.nextInt();
        int [] array = new int[n];
        for (int x = 0 ; x<=n-1; x++){
            System.out.println("input the value for " + x + " :");
            int p = ss.nextInt();
            array[x]=p;
        }
        System.out.println("the array is : " + Arrays.toString(array));
        System.out.println("your given summation:");
        int k = ss.nextInt();
        s.array(array, k);
    }
}
```

Output:

```
input the range of your array:
6
input the value for 0 :
1
input the value for 1 :
6
input the value for 2 :
2
input the value for 3 :
5
input the value for 4 :
3
input the value for 5 :
4
the array is : [1, 6, 2, 5, 3, 4]
your given summation:
7
the  rearrange array is : [1, 2, 3, 4, 5, 6]
from this array the sum of 1 and 6 is equal to your given value 7
from this array the sum of 2 and 5 is equal to your given value 7
from this array the sum of 3 and 4 is equal to your given value 7

Process finished with exit code 0
```