**Assignment JAVA Concepts**

1. With reference to the discussions related to "Unit-2: Class & Object in JAVA",  each one of you have to design a single file with at least 15 methods to demonstrate each concepts discussed in the class,i.e. non-static methods, method overloading, pass object as argument, return object as argument, static methods, pass array as argument, return array from  method, all programming construct, etc.

**Code:**

public class Main {

*// Non-static method*

    public void sayHello() {

        System.out.println("Hello!");

    }

*// Method overloading*

    public int sum(int a, int b) {

        return a + b;

    }

    public double sum(double a, double b) {

        return a + b;

    }

*// Passing an object as an argument*

    public void printPersonName(Person p) {

        System.out.println(p.getName());

    }

*// Returning an object as an argument*

    public Person createPerson(String name, int age) {

        return new Person(name, age);

    }

*// Static method*

    public static void sayGoodbye() {

        System.out.println("Goodbye!");

    }

*// Passing an array as an argument*

    public int sumArray(int[] nums) {

        int sum = 0;

        for (int n : nums) {

            sum += n;

        }

        return sum;

    }

*// Returning an array from method*

    public int[] getEvenNumbers(int[] nums) {

        int count = 0;

        for (int n : nums) {

            if (n % 2 == 0) {

                count++;

            }

        }

        int[] evens = new int[count];

        int index = 0;

        for (int n : nums) {

            if (n % 2 == 0) {

                evens[index] = n;

                index++;

            }

        }

        return evens;

    }

*// If-else statement*

    public void isNumberPositive(int n) {

        if (n > 0) {

            System.out.println("Number is positive.");

        } else {

            System.out.println("Number is not positive.");

        }

    }

*// Switch statement*

    public void printDayOfWeek(int day) {

        switch (day) {

            case 1:

                System.out.println("Monday");

                break;

            case 2:

                System.out.println("Tuesday");

                break;

            case 3:

                System.out.println("Wednesday");

                break;

            case 4:

                System.out.println("Thursday");

                break;

            case 5:

                System.out.println("Friday");

                break;

            case 6:

                System.out.println("Saturday");

                break;

            case 7:

                System.out.println("Sunday");

                break;

            default:

                System.out.println("Invalid day of week.");

                break;

        }

    }

*// For loop*

    public void printNumbers(int n) {

        for (int i = 1; i <= n; i++) {

            System.out.println(i);

        }

    }

*// While loop*

    public void printEvenNumbers(int n) {

        int i = 2;

        while (i <= n) {

            System.out.println(i);

            i += 2;

        }

    }

*// Do-while loop*

    public void printOddNumbers(int n) {

        int i = 1;

        do {

            System.out.println(i);

            i += 2;

        } while (i <= n);

    }

*// Try-catch block*

    public void divide(int a, int b) {

        try {

            int result = a / b;

            System.out.println("Result: " + result);

        } catch (ArithmeticException e) {

            System.out.println("Cannot divide by zero.");

        }

    }

}

**Output Screenshot:**