Java Assignment - 1

1) Write a program to find whether the no entered by the user is even or odd.

```java
import java.util.Scanner;

public class Problem1 {

    private static boolean isEven(int num) {
        if(num % 2 == 0)
            return true;
        else
            return false;
    }

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

        System.out.print("Enter a number: ");
        int num = sc.nextInt();

        if(isEven(num))
            System.out.println("The number " + num + " is EVEN!");
        else
            System.out.println("The number " + num + " is ODD!");

        sc.close();
    }
}
```

```
Enter a number: 15
The number 15 is ODD!
```

```
Enter a number: 16
The number 16 is EVEN!
```

2) Write a program to swap the values of 2 nos. (Take input from the user).
eg a=10 b=20f

after swapping
a=20 b=10

```
import java.util.Scanner;

public class Problem2 {

    private static void swap(int num1, int num2) {
        num1 = num1 + num2;
        num2 = num1 - num2;
        num1 = num1 - num2;

        System.out.println("\nAfter swap: \nNumber 1: " + num1 +
   "\tNumber 2: " + num2);
    }

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

        System.out.print("Enter 2 numbers: ");
        int num1 = sc.nextInt();
        int num2 = sc.nextInt();

        System.out.println("\nBefore swap: \nNumber 1: " + num1 +
   "\tNumber 2: " + num2);

        swap(num1, num2);

        sc.close();
    }
}
```

```
Enter 2 numbers: 10 20

Before swap:
Number 1: 10    Number 2: 20

After swap:
Number 1: 20    Number 2: 10
```

3) Write a program to find the greatest between the 3 nos and display the output. (Take input from the user).

```java
import java.util.Scanner;

public class Problem3 {

    private static int greatest(int num1, int num2, int num3) {
        if(num1 > num2 && num1 > num3)
            return num1;
        else if(num2 > num1 && num2 > num3)
            return num1;
        else
            return num3;
    }

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

        System.out.print("Enter 3 numbers: ");
        int num1 = sc.nextInt();
        int num2 = sc.nextInt();
        int num3 = sc.nextInt();

        int result = greatest(num1, num2, num3);

        System.out.println("The greatest number is: " + result);
```

```
        sc.close();
    }
}
```

```
Enter 3 numbers: 25 15 10
The greatest number is: 25
```

4) Write a program to find whether the character entered by the user is a vowel or not. (Solve by using if..else and switch case).

```
import java.util.Scanner;

public class Problem4 {

    private static boolean ifVowel(char character) {
        /*if(character == 'a' || character == 'e' || character == 'i' ||
   character == 'o' || character == 'u')
            return true;
        else
            return false;*/

        switch(character) {
        //break keyword is not required here because the function is
   returning a boolean value and the break keyword would be unreachable
        case 'a': return true;
        case 'e': return true;
        case 'i': return true;
        case 'o': return true;
        case 'u': return true;
        default: return false;
        }
    }

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

```
        System.out.print("Enter a character: ");
        char character = sc.next().charAt(0);

        if(ifVowel(character))
            System.out.println("The character " + character + " is a
   VOWEL!");
        else
            System.out.println("The character " + character + " is a
   CONSONANT!");

        sc.close();
    }
}
```

```
Enter a character: a
The character a is a VOWEL!
```

```
Enter a character: z
The character z is a CONSONANT!
```

5) Write a program to print even nos from 1-50 using while loop.

```
public class Problem5 {

    private static boolean isEven(int num) {
        if(num % 2 == 0)
            return true;
        else
            return false;
    }

    public static void main(String[] args) {
        int num = 1;

        System.out.println("Even numbers from 1-50: ");
        while(num <= 50) {
            if(isEven(num))
```

```
                System.out.print(num + " ");
            num++;
        }
    }
}
```

```
Even numbers from 1-50:
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50
```

6) Write a program to print odd nos from 50-100 using do-while loop.

```
public class Problem6 {

    private static boolean isEven(int num) {
        if(num % 2 == 0)
            return true;
        else
            return false;
    }

    public static void main(String[] args) {
        int num = 51;

        System.out.println("Odd numbers from 50-100: ");
        do {
            if(!isEven(num))
                System.out.print(num + " ");
            num++;
        } while(num <= 100);
    }
}
```

```
Odd numbers from 50-100:
51 53 55 57 59 61 63 65 67 69 71 73 75 77 79 81 83 85 87 89 91 93 95 97 99
```

7) Given a number N, print sum of all even numbers from 1 to N.

```java
import java.util.Scanner;

public class Problem7 {

    private static boolean isEven(int num) {
        if(num % 2 == 0)
            return true;
        else
            return false;
    }

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

        System.out.print("Enter a number: ");
        int num = sc.nextInt();

        int i = 0, sum = 0;
        while(i <= num) {
            if(isEven(i))
                sum += i;
            i++;
        }
        System.out.println("Sum of all even numbers from 1 to " + num +
   " is: " + sum);

        sc.close();
    }
}
```

```
Enter a number: 20
Sum of all even numbers from 1 to 20 is: 110
```

---

8) Write a program to print the following patterns:

a) for n=4

```
1
22
333
4444
```

b) for n=4

```
4444
4444
4444
4444
```

c) for n=5

```
    *
   **
  ***
 ****
*****
```

```java
import java.util.Scanner;

public class Problem8 {

    private static void pattern1(int num) {
        for(int i = 1; i <= num; i++) {
            for(int j = 1; j <= i; j++) {
                System.out.print(i);
            }
            System.out.print("\n");
        }
    }

    private static void pattern2(int num) {
        for(int i = 1; i <= num; i++) {
            for(int j = 1; j <= num; j++) {
                System.out.print(num);
            }
            System.out.print("\n");
        }
    }

    private static void pattern3(int num) {
        for(int i = 1; i <= num; i++) {
            for(int j = 1; j <= num-i; j++) {
                System.out.print(" ");
            }
            for(int j = 1; j <= i; j++) {
```

```
                System.out.print("*");
            }
            System.out.print("\n");
        }
    }

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

        System.out.println("-----Pattern 1-----");
        System.out.print("Enter a number: ");
        int num = sc.nextInt();
        pattern1(num);

        System.out.println("\n-----Pattern 2-----");
        System.out.print("Enter a number: ");
        num = sc.nextInt();
        pattern2(num);

        System.out.println("\n-----Pattern 3-----");
        System.out.print("Enter a number: ");
        num = sc.nextInt();
        pattern3(num);

        sc.close();
    }
}
```

```
-----Pattern 1-----
Enter a number: 5
1
22
333
4444
55555
```

```
-----Pattern 2-----
Enter a number: 4
4444
4444
4444
4444
```

```
-----Pattern 3-----
Enter a number: 6
     *
    **
   ***
  ****
 *****
******
```

9) Write a program to reverse an Array.

```
import java.util.Scanner;

public class Problem9 {

    static void reverse(int[] arr, int num)
    {
        int[] rev_arr = new int[num];
        int j = num;
        for (int i = 0; i < num; i++) {
            rev_arr[j - 1] = arr[i];
            j = j - 1;
        }

        System.out.println("\nAfter reversing: ");
        for(int i = 0; i < num; i++)
            System.out.print(rev_arr[i] + " ");
    }

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

        System.out.print("Enter the size of the array: ");
        int num = sc.nextInt();

        int[] arr = new int[num];

        System.out.print("Enter the elements: ");
        for(int i = 0; i < num; i++)
            arr[i] = sc.nextInt();

        System.out.println("\nBefore reversing: ");
        for(int i = 0; i < num; i++)
            System.out.print(arr[i] + " ");
```

```
        reverse(arr, arr.length);

        sc.close();
    }
}
```

```
Enter the size of the array: 4
Enter the elements: 1 2 3 4

Before reversing:
1 2 3 4
After reversing:
4 3 2 1
```

10) Write a program to Swap the nos in Array.

```
import java.util.Scanner;

public class Problem10 {

    private static void swapArray(int[] arr1, int[] arr2, int size) {
        int[] temp = new int[size];

        for (int i = 0; i < size; i++) {
            temp[i] = arr1[i];
            arr1[i] = arr2[i];
            arr2[i] = temp[i];
        }
        System.out.println("\n\n-----After Swapping-----");
        System.out.println("First Array: ");
        for (int i = 0; i < size; i++) {
            System.out.print(arr1[i] + " ");
        }
        System.out.println("\nSecond Array: ");
        for (int i = 0; i < size; i++) {
```

```
            System.out.print(arr2[i] + " ");
        }
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the size of the arrays: ");
        int size = sc.nextInt();

        int[] arr1 = new int[size], arr2 = new int[size];
        System.out.print("\nEnter the elements of the First Array: ");
        for (int i = 0; i < size; i++) {
            arr1[i] = sc.nextInt();
        }

        System.out.print("Enter the elements of the Second Array: ");
        for (int i = 0; i < size; i++) {
            arr2[i] = sc.nextInt();
        }

        System.out.println("\n-----Before Swapping-----");

        System.out.println("First Array: ");
        for (int i = 0; i < size; i++) {
            System.out.print(arr1[i] + " ");
        }

        System.out.println("\nSecond Array: ");
        for (int i = 0; i < size; i++) {
            System.out.print(arr2[i] + " ");
        }

        swapArray(arr1, arr2, size);

        sc.close();
    }
```

```
}
```

```
Enter the size of the arrays: 5

Enter the elements of the First Array: 1 2 3 4 5
Enter the elements of the Second Array: 6 7 8 9 10

-----Before Swapping-----
First Array:
1 2 3 4 5
Second Array:
6 7 8 9 10

-----After Swapping-----
First Array:
6 7 8 9 10
Second Array:
1 2 3 4 5
```

11) Write a program to calculate and display the factorial of a no entered by the user.

```java
import java.util.Scanner;

public class Problem11 {

    private static int factorial(int num) {
        int fact = 1;
        for(int i = 1; i <= num; i++)
            fact *= i;

        return fact;
    }

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

```
        System.out.print("Enter the number: ");
        int num = sc.nextInt();

        int fact = factorial(num);
        System.out.println("The factorial of " + num + " is: " + fact);

        sc.close();
    }
}
```

```
Enter the number: 10
The factorial of 10 is: 3628800
```

12) Write a program to check whether the no entered by the user is prime or not.

```
import java.util.Scanner;

public class Problem12 {

    private static boolean isPrime(int num) {
        if (num <= 1)
            return false;

        for (int i = 2; i < num; i++)
            if (num % i == 0)
                return false;

        return true;
    }

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

        System.out.print("Enter the number: ");
```

```
        int num = sc.nextInt();

        if(isPrime(num))
            System.out.println("The number " + num + " is a PRIME
   NUMBER!");
        else
            System.out.println("The number " + num + " is a COMPOSITE
   NUMBER!");

        sc.close();
    }
}
```

```
Enter the number: 3
The number 3 is a PRIME NUMBER!
```

```
Enter the number: 4
The number 4 is a COMPOSITE NUMBER!
```

13) Given an integer N, print all the prime numbers that lie in the range 2 to N (both inclusive).

```
import java.util.Scanner;

public class Problem13 {

    private static boolean isPrime(int num) {
        if (num <= 1)
            return false;

        for (int i = 2; i < num; i++)
            if (num % i == 0)
                return false;

        return true;
    }
```

```
    private static void printPrimeNums(int num) {
        for (int i = 2; i <= num; i++) {
            if (isPrime(i))
                System.out.print(i + " ");
        }
    }

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

        System.out.print("Enter the number: ");
        int num = sc.nextInt();

        System.out.println("\nPrime numbers between 2 and " + num + ":
   ");
        printPrimeNums(num);

        sc.close();
    }
}
```

```
Enter the number: 100

Prime numbers between 2 and 100:
2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97
```

14) Write a program to generate the reverse of a given number N. Print the corresponding reverse number.

```
import java.util.Scanner;

public class Problem14 {

    private static int reverse(int num) {
        int result = 0;
        while (num > 0) {
```

```
            result = result * 10 + num % 10;
            num /= 10;
        }
        return result;
    }

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

        System.out.print("Enter the number: ");
        int num = sc.nextInt();

        int result = reverse(num);
        System.out.println("The reverse of " + num + " is: " + result);

        sc.close();
    }
}
```

```
Enter the number: 1024
The reverse of 1024 is: 4201
```