Practical – 2

Aim: To learn operators, decision making and looping in java.

1. Write a Java program to take three numbers as command line arguments and print the maximum number.
2. Write a Java program to take two floating-point numbers from the command line and print their sum, difference, product, quotient, and modulus.
3. Write a Java program using switch to display the day of the week when a number (1 to 7) is entered. Example: 1 → Monday, 2 → Tuesday, etc.
4. Write a Java program to check whether a given number is even or odd using a command line argument.
5. Write a Java program to find the sum of digits of a number using a command line argument. Example: 123 → 1+2+3 = 6
6. Write a Java program to check if the given number is a perfect number or not. (A number is perfect if sum of its divisors excluding itself is equal to the number.) Example: 28 → 1+2+4+7+14 = 28
7. Write a Java program to generate and print n terms of the Harmonic series. Harmonic series: 1 + 1/2 + 1/3 + 1/4 + ...
8. Write a Java program to print all factors of a given number using a command line argument.
9. Write a Java program to find the maximum and minimum of four numbers using nested if-else.
10. Write a Java program to show widening and narrowing typecasting between int, float, and double.
11. Write a Java program to print all prime numbers between 1 and n using: (a) for loop (b) while loop (c) do-while loop
12. Write a Java program to print a number triangle. Example for n = 4: 1 12 123 1234
13. Write a Java program to declare an int variable x = 5 and test these increment and decrement statements: System.out.println(++x); System.out.println(x--); System.out.println(x);

System.out.println(--x);
System.out.println(x++);
System.out.println(x);
Add comments on output.

14. Write a Java program to declare three variables a = 5, b = 2.5, c = 4.0, and display the result of:
System.out.println(a + b * c);
System.out.println(++a * b - c);
System.out.println(a / b + c);
Add comments explaining operator precedence.

Q:01

```
public class p_2_1 {
    public static void main(String[] args) {
        //print maximum of 3 number..
        if (args.length < 3) {
            System.out.println("enter valid input ");
            return;
        }
        else{
        int num1 =Integer.parseInt(args[0]);
        int num2 =Integer.parseInt(args[1]);
        int num3 =Integer.parseInt(args[2]);
        int max = num1;
        if(num2 > max) {
            max = num2;
        }
        if(num3 > max) {
            max = num3;
        }
        System.out.println("Maximum number is: " + max);
    }
    }
}
```

```
enter valid input
PS D:\SEM-03\OPP PRACTICAL\Practical_02> javac p_2_1.java
PS D:\SEM-03\OPP PRACTICAL\Practical_02> java p_2_1 10 12 14
Maximum number is: 14
PS D:\SEM-03\OPP PRACTICAL\Practical_02>
```

Q:2

```
public class p_2_2 {
    public static void main(String[] args) {
        Float num1 =Float.parseFloat(args[0]);
        Float num2 =Float.parseFloat(args[1]);
        System.out.println("Sum : " + (num1 + num2));
```

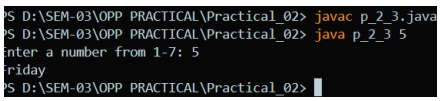
```
        System.out.println("Difference: " + (num1 - num2));
        System.out.println("Product: " + (num1 * num2));
        System.out.println("Division: " + (num1 / num2));
        }
    }
```

```
PS D:\SEM-03\OPP PRACTICAL\Practical_02> javac p_2_2.java
PS D:\SEM-03\OPP PRACTICAL\Practical_02> java p_2_2 7 5
Sum : 12.0
Difference: 2.0
Product: 35.0
Division: 1.4
PS D:\SEM-03\OPP PRACTICAL\Practical_02>
```

Q:03

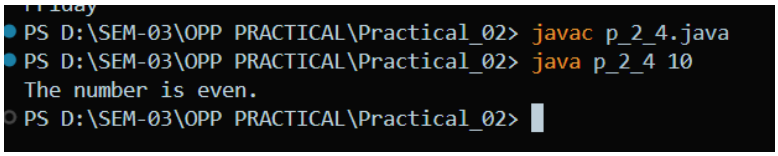
```
import java.util.Scanner;
public class p_2_3{
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number from 1-7: ");
        int dayNumber = sc.nextInt();
        switch (dayNumber) {
            case 1:
                System.out.println("Monday");
                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 input.");
    }
    sc.close();
  }
}
```



Q:4

```
public class p_2_4 {
  public static void main(String[] args) {
    int num1 = Integer.parseInt(args[0]);
    if (num1 % 2 == 0) {
      System.out.println("The number is even.");
    } else {
      System.out.println("The number is odd.");
    }
  }
}
```



Q:5

```
public class p_2_5 {
  public static void main(String[] args) {
    //Write a Java program to find the sum of digits of a number using a command line argument. Example: 123 → 1+2+3 = 6
```

```
        int num = Integer.parseInt(args[0]);
        int sum = 0;
        while (num > 0) {
            sum += num % 10;
            num /= 10;
        }
        System.out.println("The sum of the digits is: " + sum);
    }
}
```

```
PS D:\SEM-03\OPP PRACTICAL\Practical_02> javac p_2_5.java
PS D:\SEM-03\OPP PRACTICAL\Practical_02> java p_2_5 123
The sum of the digits is: 6
PS D:\SEM-03\OPP PRACTICAL\Practical_02>
```

Q:6

```
public class p_2_6 {
public static void main(String[] args) {
    int sum = 0;
    int num = Integer.parseInt(args[0]);
    for (int i = 1; i < num ; i++) {
        if (num % i == 0) {
            sum += i;
        }
    }
    if (sum == num) {
        System.out.println(num + " is a perfect number.");
    } else {
        System.out.println(num + " is not a perfect number.");
    }
}
}
```

```
PS D:\SEM-03\OPP PRACTICAL\Practical_02> javac p_2_6.java
PS D:\SEM-03\OPP PRACTICAL\Practical_02> java p_2_6 28
28 is a perfect number.
```

Q:7

```
public class p_2_7 {
    public static void main(String[] args) {
        if (args.length < 1) {
            System.out.println("n is command line argument");
            return;
        }
        int n = Integer.parseInt(args[0]); // number of terms
        double sum = 0.0;
        System.out.print("Harmonic series: ");
        for (int i = 1; i <= n; i++) {
            System.out.print("1/" + i);
            if (i < n) {
                System.out.print(" + ");
            }
            sum += 1.0 / i;
        }
        System.out.println();
        System.out.println("Sum of series up to " + n + " terms: " + sum);
    }
}
```

```
PS D:\SEM-03\OPP PRACTICAL\Practical_02> javac p_2_7.java
PS D:\SEM-03\OPP PRACTICAL\Practical_02> java p_2_7 7
Harmonic series: 1/1 + 1/2 + 1/3 + 1/4 + 1/5 + 1/6 + 1/7
Sum of series up to 7 terms: 2.5928571428571425
PS D:\SEM-03\OPP PRACTICAL\Practical_02>
```

Q:8

```
public class p_2_8 {
    public static void main(String[] args) {
        //give one imput
```

```
        int num = Integer.parseInt(args[0]);
        System.out.println("Factors of " + num + " are:");
        for (int i = 1; i <= num; i++) {
            if (num % i == 0) {
                System.out.print(i + " ");
            }
        }
    }
}
```

```
PS D:\SEM-03\OPP PRACTICAL\Practical_02> javac p_2_8.java
PS D:\SEM-03\OPP PRACTICAL\Practical_02> java p_2_8 10
Factors of 10 are:
1 2 5 10
PS D:\SEM-03\OPP PRACTICAL\Practical_02>
```

Q:9

```
public class p_2_9 {
    public static void main(String[] args) {



        int num1 = Integer.parseInt(args[0]);
        int num2 = Integer.parseInt(args[1]);
        int num3 = Integer.parseInt(args[2]);
        int num4 = Integer.parseInt(args[3]);
        int max, min;
        // Find maximum using nested if-else
        if (num1 > num2) {
            if (num1 > num3) {
                if (num1 > num4) {
                    max = num1;
                } else {
                    max = num4;
                }
```

```
        } else {
            if (num3 > num4) {
                max = num3;
            } else {
                max = num4;
            }
        }
    } else {
        if (num2 > num3) {
            if (num2 > num4) {
                max = num2;
            } else {
                max = num4;
            }
        } else {
            if (num3 > num4) {
                max = num3;
            } else {
                max = num4;
            }
        }
    }

    // Find minimum using nested if-else
    if (num1 < num2) {
        if (num1 < num3) {
            if (num1 < num4) {
                min = num1;
            } else {
                min = num4;
            }
```

```
            } else {
                if (num3 < num4) {
                    min = num3;
                } else {
                    min = num4;
                }
            }
        } else {
            if (num2 < num3) {
                if (num2 < num4) {
                    min = num2;
                } else {
                    min = num4;
                }
            } else {
                if (num3 < num4) {
                    min = num3;
                } else {
                    min = num4;
                }
            }
        }
        System.out.println("Maximum: " + max);
        System.out.println("Minimum: " + min);
    }
}
```

```
PS D:\SEM-03\OPP PRACTICAL\Practical_02> java p_2_9 78 61 89 36
Maximum: 89
Minimum: 36
PS D:\SEM-03\OPP PRACTICAL\Practical 02>
```

Q:10

```
public class p_2_10 {
    public static void main(String[] args) {
```

```
        // Widening (Implicit Casting)
        int intNum = 100;
        float floatNum = intNum;
        double doubleNum = floatNum;
        System.out.println("Widening Typecasting:");
        System.out.println("int value: " + intNum);
        System.out.println("float value (from int): " + floatNum);
        System.out.println("double value (from float): " + doubleNum);
        // Narrowing (Explicit Casting)
        double d = 123.456;
        float f = (float) d;
        int i = (int) f;
        System.out.println("\nNarrowing Typecasting:");
        System.out.println("double value: " + d);
        System.out.println("float value (from double): " + f);
        System.out.println("int value (from float): " + i);
    }
}
```

```
Widening Typecasting:
int value: 100
float value (from int): 100.0
double value (from float): 100.0

Narrowing Typecasting:
double value: 123.456
float value (from double): 123.456
int value (from float): 123
```

Q:11

```
public class p_2_11 {
    public static void main(String[] args) {
        int n = Integer.parseInt(args[0]);
        System.out.println("Prime numbers between 1 and " + n + " using for loop:");
        forLoopPrime(n);
        System.out.println("\nPrime numbers between 1 and " + n + " using while loop:");
        whileLoopPrime(n);
```

```
        System.out.println("\nPrime numbers between 1 and " + n + " using do-while loop:");
        doWhileLoopPrime(n);
    }
    // Check prime helper method
    public static boolean isPrime(int num) {
        if (num <= 1) return false;
        for (int i = 2; i <= Math.sqrt(num); i++) {
            if (num % i == 0) return false;
        }
        return true;
    }
    // (a) For loop
    public static void forLoopPrime(int n) {
        for (int i = 2; i <= n; i++) {
            if (isPrime(i)) {
                System.out.print(i + " ");
            }
        }
    }
    // (b) While loop
    public static void whileLoopPrime(int n) {
        int i = 2;
        while (i <= n) {
            if (isPrime(i)) {
                System.out.print(i + " ");
            }
            i++;
        }
    }
    // (c) Do-while loop
    public static void doWhileLoopPrime(int n) {
```

```
        int i = 2;
        if (n >= 2) {
            do {
                if (isPrime(i)) {
                    System.out.print(i + " ");
                }
                i++;
            } while (i <= n);
        }
    }
}
```

```
PS D:\SEM-03\OPP PRACTICAL\Practical_02> java p_2_11 12
Prime numbers between 1 and 12 using for loop:
2 3 5 7 11
Prime numbers between 1 and 12 using while loop:
2 3 5 7 11
Prime numbers between 1 and 12 using do-while loop:
2 3 5 7 11
PS D:\SEM-03\OPP PRACTICAL\Practical_02>
```

Q:12

```
public class p_2_12 {
    public static void main(String[] args) {
        int n = Integer.parseInt(args[0]);
        for (int i = 1; i <= n; i++) {
            for (int j = 1; j <= i; j++) {
                System.out.print(j);
            }
            System.out.println();
        }
    }
}
```

```
PS D:\SEM-03\OPP PRACTICAL\Practical_02> java p_2_12 5
1
12
123
1234
12345
```

Q:13

```
public class p_2_13{
    public static void main(String[] args) {
        int x =5;
        System.out.println(++x);
        System.out.println(x--);
        System.out.println(x);
        System.out.println(--x);
        System.out.println(x++);
        System.out.println(x);
    }
}
```

```
\Practical_02_
6
6
5
4
4
5
```

Q:14

```
public class p_2_14 {
    public static void main(String[] args) {
        int a=5;
        float b =2.5f;
        float c =4.0f;
        System.out.println(a+b*c);
        System.out.println(++a*b-c);
        System.out.println(a/b+c);
    }
```

}

```
PS D:\SEM-03\OPP PRACTICAL
15.0
11.0
6.4
```