JOBSHEET 7
LOOP 1

1. Learning Outcome

After finishing this topic, students must be able to:

- explain the format of loop programming part 1
- implement a loop part 1 flowchart using the Java programming language

2. Labs Activity

2.1 Lab 1: Counting Multiples Using FOR

Time: 60 minutes

In this experiment, the code is created to display multiples of a specific number within the range of 1 to 50 using a FOR loop, and to calculate the total of these numbers.

1. Open text editor. Create a new Java File named **ForMultiplesNoAbsen.java**
2. Create the basic structure of Java program containing **class** declaration and **main()** method
3. Add the **Scanner** library.
4. Create or declare variable named **input** from **Scanner** library.
5. Create **int** variables named **multiple**, **sum**, and **counter**. Initialize variable **sum** and **counter** with 0.
6. Add the following code to get the user input!

```
System.out.print(s:"Input the multiple: ");
multiple = input.nextInt();
```

7. Create the FOR loop with IF condition to evaluate the multiples number

```
for(int i=1; i <= 50; i++) {
    if(i % multiple == 0) {
        sum = sum + i;
        counter++;

    }
}
```

8. Display the sum and counter of multiples number in range from 1 to 50.

```
System.out.printf(format:"There are %d number that are multiple of %d in range 1 to 50.\n", counter, multiple);
System.out.printf(format:"The sum of all multiples of %d in range 1 to 50 is %d. \n", multiple, sum);
```

9. Run the program and analyze the result. Your result must be like this:

```
Input the multiple: 5
There are 10 number that are multiple of 5 in range 1 to 50.
The sum of all multiples of 5 in range 1 to 50 is 275.
```

Questions

1. There are 3 main components in FOR loop. Based on experiment 1 above, identify and explain these 3 components!

   Answer:

   1. Initialization (int i = 1) the starting loop, counter I, it runs once at the beginning of the loop

   2. Condition (i<= 50) this is the test that must be true , i became a greater than 50 the loops stop.

   3.Update (i++) this increases the value of i by 1 each loop iteration

2. Explain how the following code works!

```
for(int i=1; i <= 50; i++) {
    if(i % multiple == 0) {
        sum = sum + i;
        counter++;

    }
}
```

Answer :

1. for (int I =1; i<=5) Starts a loop from i = 1 to i = 50. It increases i by 1 each time.
2. If (I % multiple ==) Checks if i is divisible by multiple. The % operator gives the remainder, so this condition is true when i is a multiple.
3. Sum=sum +I; adds the current multiple to the total sum
4. Counter==; increases the count of how many multile have been found

3. Modify the existing code by adding a new variable to calculate the average of all the specified multiples!

   Answer:

4. Create a new Java program file named **WhileMultiplesNoAbsen.java**.

Answer

```
// === WHILE LOOP ===
while (i <= 50) {
    if (i % multiple == 0) {
        sum += i;
        counter++;
    }
    i++;
}

// === OUTPUT ===
if (counter > 0) {
    average = (double) sum / counter;
    System.out.println("Total multiples of " + multiple + " from 1 to 50: " + counter);
    System.out.println("Sum of those multiples: " + sum);
    System.out.println("Average: " + average);
} else {
    System.out.println("No multiples of " + multiple + " found between 1 and 50.");
}
```

2.2 Lab 2: Show Multiplication of 2

Times: 40 minutes

We want to create a program which take any number more than 2 and print the multiplication of 2 within given input.

1. Open the text editor and create a new Java file named **DisplayTwoNoAbsen.java**
2. Create the basic structure of Java program containing **class** declaration and **main**() method
3. Add the **Scanner** library.
4. Create or declare variable named **input** from **Scanner** library.
5. Declare **int** variable named **numInput**.
6. Add the following code to input from user.

```
System.out.print(s:"Input some number: ");
numInput = input.nextInt();
```

7. Add this following FOR loop.

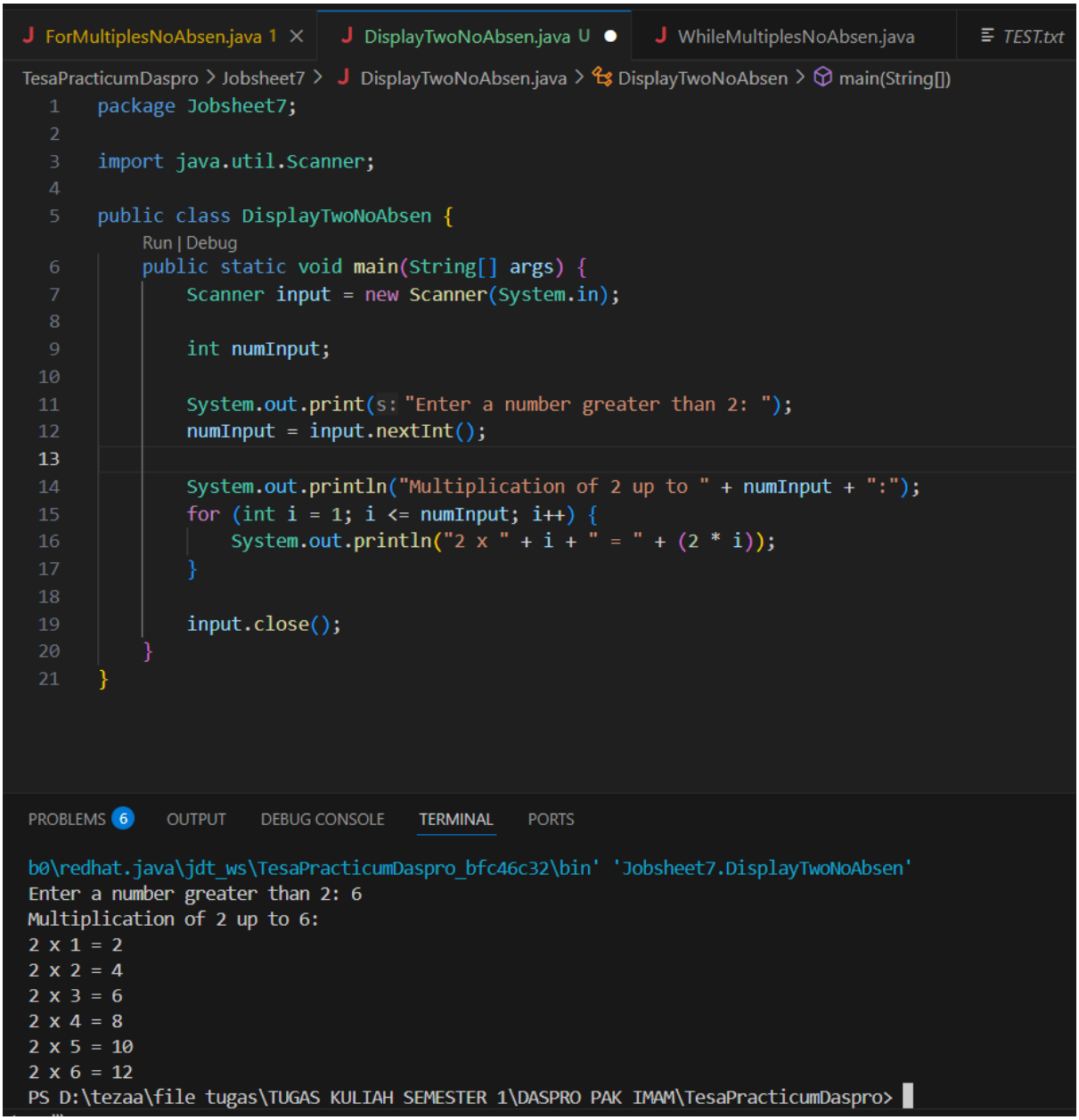
```
for(int i = 1; i <= numInput; i++) {
    if(i % 2 == 0) {
        System.out.println("2 multiple: "+i);
    }
}
```

8. Compile and run the program.
9. Expected result:

```
Input some number: 10
2 multiple: 2
2 multiple: 4
2 multiple: 6
2 multiple: 8
2 multiple: 10
```

Questions

1. Do modification to make the program produce similar result but **WITHOUT IF** statement. Please insert a screenshot of your code to the report.

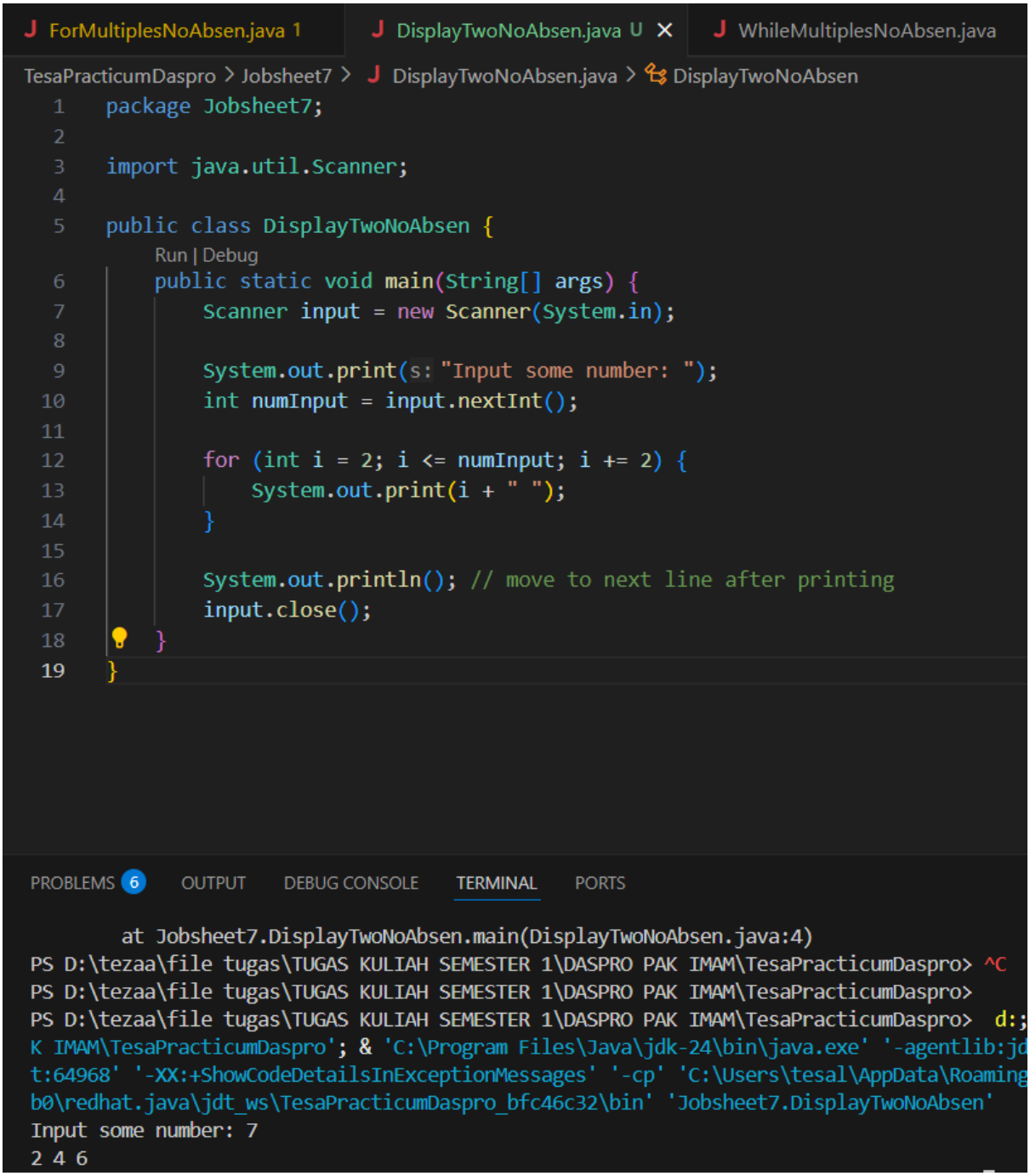


```java
package Jobsheet7;

import java.util.Scanner;

public class DisplayTwoNoAbsen {
    Run | Debug
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);

        int numInput;

        System.out.print(s: "Enter a number greater than 2: ");
        numInput = input.nextInt();

        System.out.println("Multiplication of 2 up to " + numInput + ":");
        for (int i = 1; i <= numInput; i++) {
            System.out.println("2 x " + i + " = " + (2 * i));
        }

        input.close();
    }
}
```

```
b0\redhat.java\jdt_ws\TesaPracticumDaspro_bfc46c32\bin' 'Jobsheet7.DisplayTwoNoAbsen'
Enter a number greater than 2: 6
Multiplication of 2 up to 6:
2 x 1 = 2
2 x 2 = 4
2 x 3 = 6
2 x 4 = 8
2 x 5 = 10
2 x 6 = 12
PS D:\tezaa\file tugas\TUGAS KULIAH SEMESTER 1\DASPRO PAK IMAM\TesaPracticumDaspro>
```

2. Do modification to make the program print like this following result. Please insert a screenshot of your code to the report.

```
Input some number: 10
2 4 6 8 10
```



ForMultiplesNoAbsen.java 1 | DisplayTwoNoAbsen.java U | WhileMultiplesNoAbsen.java

TesaPracticumDaspro > Jobsheet7 > DisplayTwoNoAbsen.java > DisplayTwoNoAbsen

```java
package Jobsheet7;

import java.util.Scanner;

public class DisplayTwoNoAbsen {
    Run | Debug
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);

        System.out.print(s: "Input some number: ");
        int numInput = input.nextInt();

        for (int i = 2; i <= numInput; i += 2) {
            System.out.print(i + " ");
        }

        System.out.println(); // move to next line after printing
        input.close();
    }
}
```

PROBLEMS 6 | OUTPUT | DEBUG CONSOLE | TERMINAL | PORTS

```
        at Jobsheet7.DisplayTwoNoAbsen.main(DisplayTwoNoAbsen.java:4)
PS D:\tezaa\file tugas\TUGAS KULIAH SEMESTER 1\DASPRO PAK IMAM\TesaPracticumDaspro> ^C
PS D:\tezaa\file tugas\TUGAS KULIAH SEMESTER 1\DASPRO PAK IMAM\TesaPracticumDaspro>
PS D:\tezaa\file tugas\TUGAS KULIAH SEMESTER 1\DASPRO PAK IMAM\TesaPracticumDaspro>  d:;
K IMAM\TesaPracticumDaspro'; & 'C:\Program Files\Java\jdk-24\bin\java.exe' '-agentlib:jd
t:64968' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\tesal\AppData\Roaming
b0\redhat.java\jdt_ws\TesaPracticumDaspro_bfc46c32\bin' 'Jobsheet7.DisplayTwoNoAbsen'
Input some number: 7
2 4 6
```

2.3 Lab 3: The Triangle

Duration: 30 minutes

In this lab, you will create a rectangle pattern using single loop.

1. Open the text editor and create a new Java file called **TheTriangleNoAbsen.java**.
2. Create the basic structure of Java program containing class declaration and main method.
3. Add the **Scanner** library.
4. Create a variable **input** from Scanner library.
5. Create int variable called **numInput**.
6. Create int variable called **i** and give 0 as initial value.
7. Create String variable called **s** and give **empty string** as initial value.
8. Add this following code to take the input from user.

```
System.out.print(s:"Input some number: ");
numInput = input.nextInt();
```

9. Add this following loop, to print the rectangle pattern.

```
while (i < numInput) {
    s += " *";
    System.out.println(s);
    i++;
}
```

10. The expected result:

```
Input some number: 5
 *
 * *
 * * *
 * * * *
 * * * * *
```

Question

1. Do a modification on the program therefore your program utilize FOR statement rather than WHILE statement.

Answer:

2. Explain the meaning of s += " *" and why is it possible?

   Answer:
   s += " *" is **shorthand** for s = s + " *".

   It **adds** the string " *" to the end of the current value of s.

   This is possible because:

   - s is a String type.
   - Java allows **string concatenation** using the + operator.
   - The += operator works with strings to append new content.

2.4. Lab 4: Calculating Leave Entitlement Using DO-WHILE

Times: 50 minutes

In this experiment, a program code is created using DO-WHILE to calculate the **leave entitlement** of an employee. Employees are entitled to 5 days of leave. Leave days will be deducted each time they are used. When there are only 2 days of leave remaining, the employee receives a warning to stop using their leave

1. Open the text editor and create a new Java file named

DoWhileLeaveEntitlementNoAbsen.java

2. Create the basic structure of Java program containing class declaration and main() method
3. Add the **Scanner** library.
4. Create or declare variable named **input** from **Scanner** library.
5. Create variables **leaveEntitlement** and **numLeave** with int datatype.
6. Create variable **confirmation** with **String** datatype.
7. Create a DO-WHILE loop structure to get the user input from the keyboard and calculate leave entitlement

```
do {
    System.out.print(s:"Do you want to take a leave (y/n)? ");
    confirmation = input.next();

    if(confirmation.equalsIgnoreCase(anotherString:"y")) {
        System.out.print(s:"How many day(s)? ");
        numLeave = input.nextInt();

        if(numLeave <= leaveEntitlement) {
            leaveEntitlement -= numLeave;
            System.out.println("Remaining leave entitlement: "+leaveEntitlement);
        } else {
            System.out.println(x:"You dont have enough leave entitlement");
            break;
        }
    }
} while(leaveEntitlement > 0);
```

8. Run the program and analyze the result. It must be the same with the following output.

```
Input The Number of Leave Entitlement: 10
Do you want to take a leave (y/n)? y
How many day(s)? 7
Remaining leave entitlement: 3
Do you want to take a leave (y/n)? y
How many day(s)? 5
You dont have enough leave entitlement
```

Questions

1. What is the use of the BREAK within the loop syntax?

   Answer : the break statement is used to immediately exit a loop

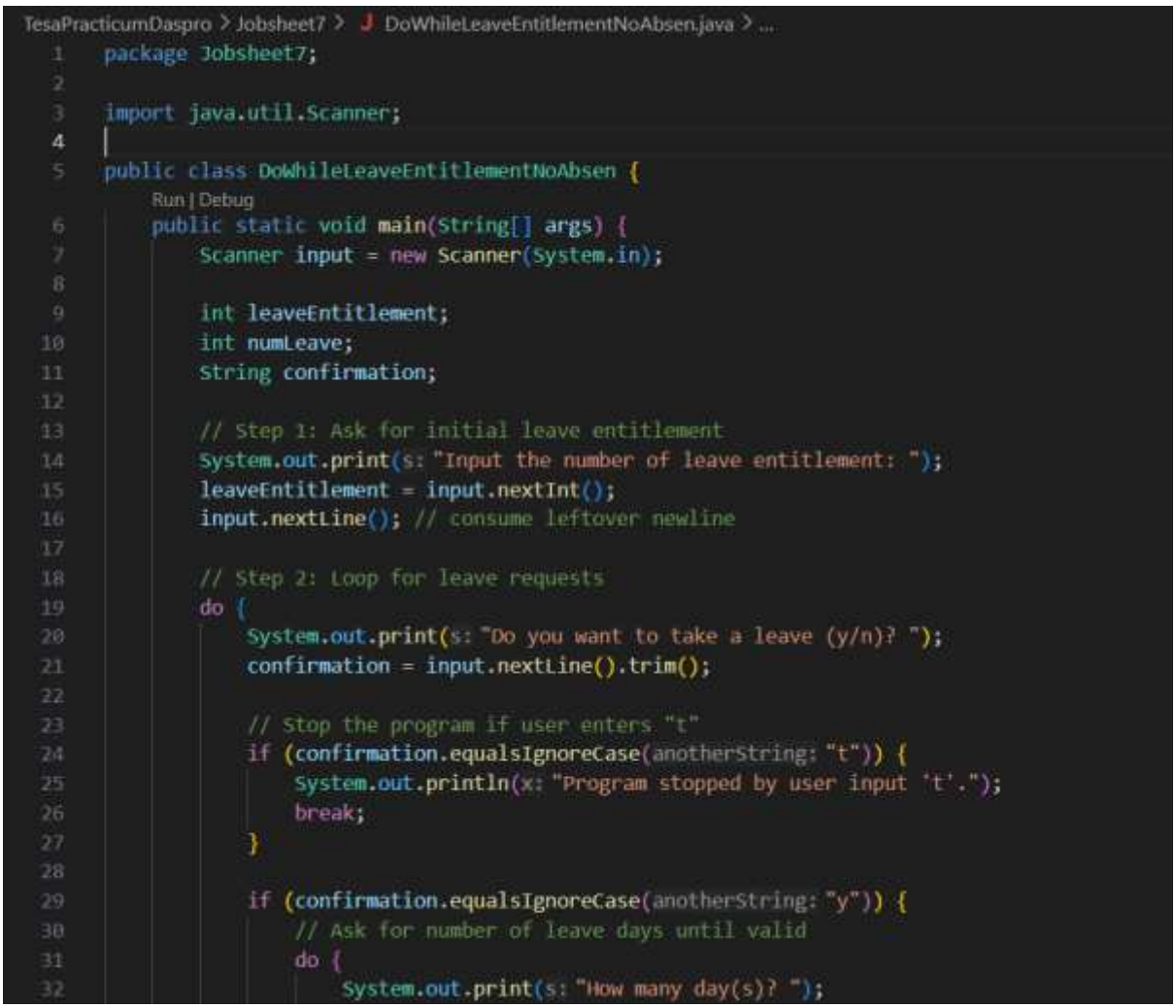
2. Modify the program so that if the number of leave days requested is greater than the remaining entitlement, the program does not stop, allowing the user to enter the number of days according to the entitlement.

```
package lobshoot7;

import java.util.Scanner;


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

        int leaveEntitlement;
        int numLeave;
        String confirmation;

        // Step 1: Ask for initial leave entitlement
        System.out.print("Input the number of leave entitlement: ");
        leaveEntitlement = input.nextInt();
        input.nextLine(); // consume leftover newline

        // Step 2: Loop for leave requests
        do {
            System.out.print("Do you want to take a leave (y/n)? ");
            confirmation = input.nextLine().trim();

            // Stop the program if user enters "t"
            if (confirmation.equalsIgnoreCase("t")) {
                System.out.println("Program stopped by user input 't'.");
                break;
            }

            if (confirmation.equalsIgnoreCase("y")) {
                // Ask for number of leave days until valid
                do {
                    System.out.print("How many day(s)? ");
                    numLeave = input.nextInt();
                    input.nextLine(); // consume leftover newline

                    if (numLeave > leaveEntitlement) {
                        System.out.println("You don't have enough leave entitlement. Please enter a valid number.");
                    }
                } while (numLeave > leaveEntitlement);

                // Update leave and show remaining
                leaveEntitlement -= numLeave;
                System.out.println("Remaining leave entitlement: " + leaveEntitlement);

                // Warning if only 2 days left
                if (leaveEntitlement == 2) {
                    System.out.println("Warning: Only 2 days of leave remaining. Please stop using leave.");
                }
            }

            // Stop if no leave remains
            if (leaveEntitlement == 0) {
                System.out.println("No leave remaining.");
                break;
            }

        } while (leaveEntitlement > 0);

        input.close();
    }
}
```

3. Commit and push the program code to GitHub.
4. When typing "t" as the confirmation input, what happens? Why?

   Will do nothing because its not Y/N

5. Modify the program code so that when the user enters "t" as the confirmation input, the program will stop.



```
TesaPracticumDaspro > Jobsheet7 > J DoWhileLeaveEntitlementNoAbsen.java > ...
1   package Jobsheet7;
2
3   import java.util.Scanner;
4
5   public class DoWhileLeaveEntitlementNoAbsen {
        Run | Debug
6       public static void main(String[] args) {
7           Scanner input = new Scanner(System.in);
8
9           int leaveEntitlement;
10          int numLeave;
11          String confirmation;
12
13          // Step 1: Ask for initial leave entitlement
14          System.out.print(s: "Input the number of leave entitlement: ");
15          leaveEntitlement = input.nextInt();
16          input.nextLine(); // consume leftover newline
17
18          // Step 2: Loop for leave requests
19          do {
20              System.out.print(s: "Do you want to take a leave (y/n)? ");
21              confirmation = input.nextLine().trim();
22
23              // Stop the program if user enters "t"
24              if (confirmation.equalsIgnoreCase(anotherString: "t")) {
25                  System.out.println(x: "Program stopped by user input 't'.");
26                  break;
27              }
28
29              if (confirmation.equalsIgnoreCase(anotherString: "y")) {
30                  // Ask for number of leave days until valid
31                  do {
32                      System.out.print(s: "How many day(s)? ");
```

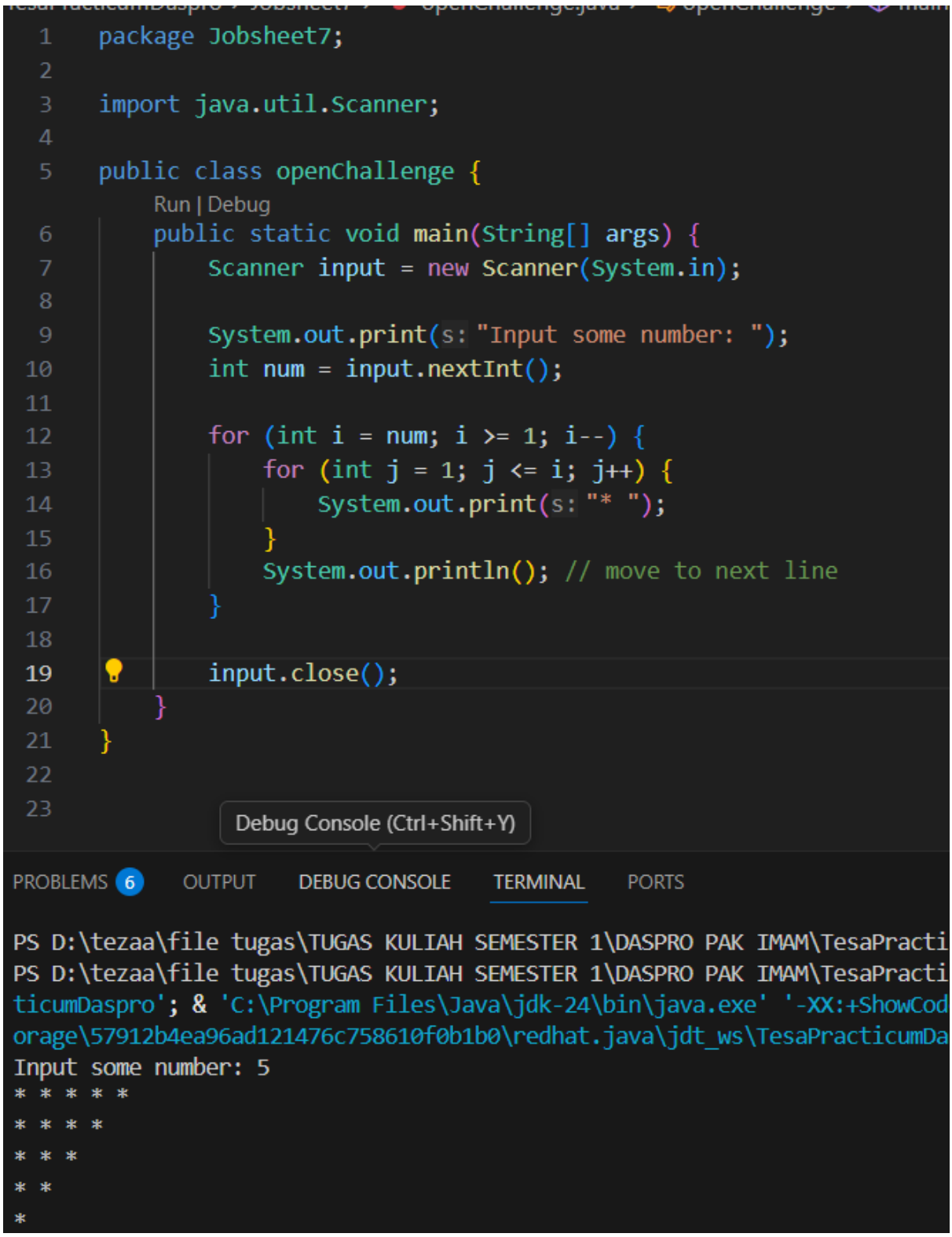
6.

```
                do {
                    System.out.print(s: "How many day(s)? ");
                    numLeave = input.nextInt();
                    input.nextLine(); // consume leftover newline

                    if (numLeave > leaveEntitlement) {
                        System.out.println(x: "You don't have enough leave entitlement. Please enter a valid number.");
                    }
                } while (numLeave > leaveEntitlement);

                // Deduct leave and show remaining
                leaveEntitlement -= numLeave;
                System.out.println("Remaining leave entitlement: " + leaveEntitlement);

                // Warning if only 2 days left
                if (leaveEntitlement == 2) {
                    System.out.println(x: "Warning: Only 2 days of leave remaining. Please stop using leave.");
                }

                // Stop if no leave remains
                if (leaveEntitlement == 0) {
                    System.out.println(x: "No leave remaining.");
                    break;
                }
            }

        } while (leaveEntitlement > 0);

        input.close();
    }
}
```

Assignment (Open Challenge)

1. Do a modification on the program from the lab 3, so you get this following result,

```
Input some number: 5
* * * * *
* * * *
* * *
* *
*
```



```java
package Jobsheet7;

import java.util.Scanner;

public class openChallenge {
    Run | Debug
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);

        System.out.print(s: "Input some number: ");
        int num = input.nextInt();

        for (int i = num; i >= 1; i--) {
            for (int j = 1; j <= i; j++) {
                System.out.print(s: "* ");
            }
            System.out.println(); // move to next line
        }

        input.close();
    }
}
```

Debug Console (Ctrl+Shift+Y)

PROBLEMS 6 OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS D:\tezaa\file tugas\TUGAS KULIAH SEMESTER 1\DASPRO PAK IMAM\TesaPracti
PS D:\tezaa\file tugas\TUGAS KULIAH SEMESTER 1\DASPRO PAK IMAM\TesaPracti
ticumDaspro'; & 'C:\Program Files\Java\jdk-24\bin\java.exe' '-XX:+ShowCod
orage\57912b4ea96ad121476c758610f0b1b0\redhat.java\jdt_ws\TesaPracticumDa
Input some number: 5
* * * * *
* * * *
* * *
* *
*
```