

PRACTICUM REPORT

Job sheet 3

Variables, Data Types, and Operators



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Contents

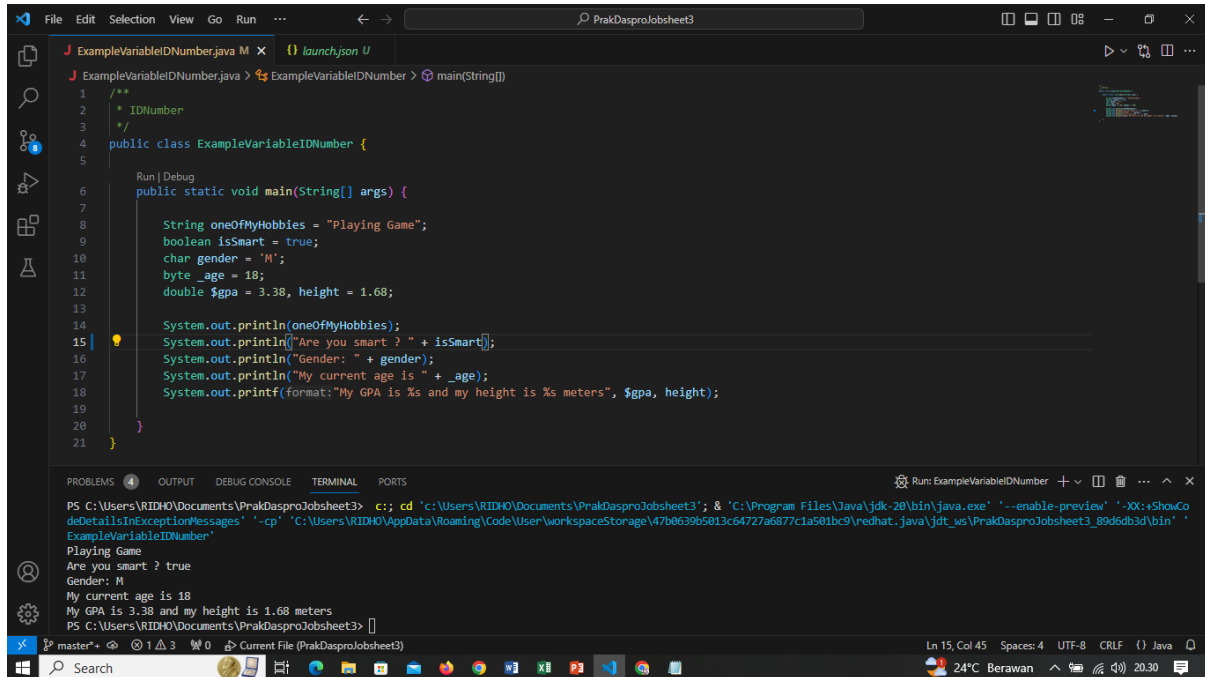
Experiment 1	3
Experiment 2.....	4
Experiment 3	5
Experiment 4.....	6
Experiment 5.....	7

Experiment 1

Questions!

1. Change the variable name so that the variable naming model is good and correct!

Answer :



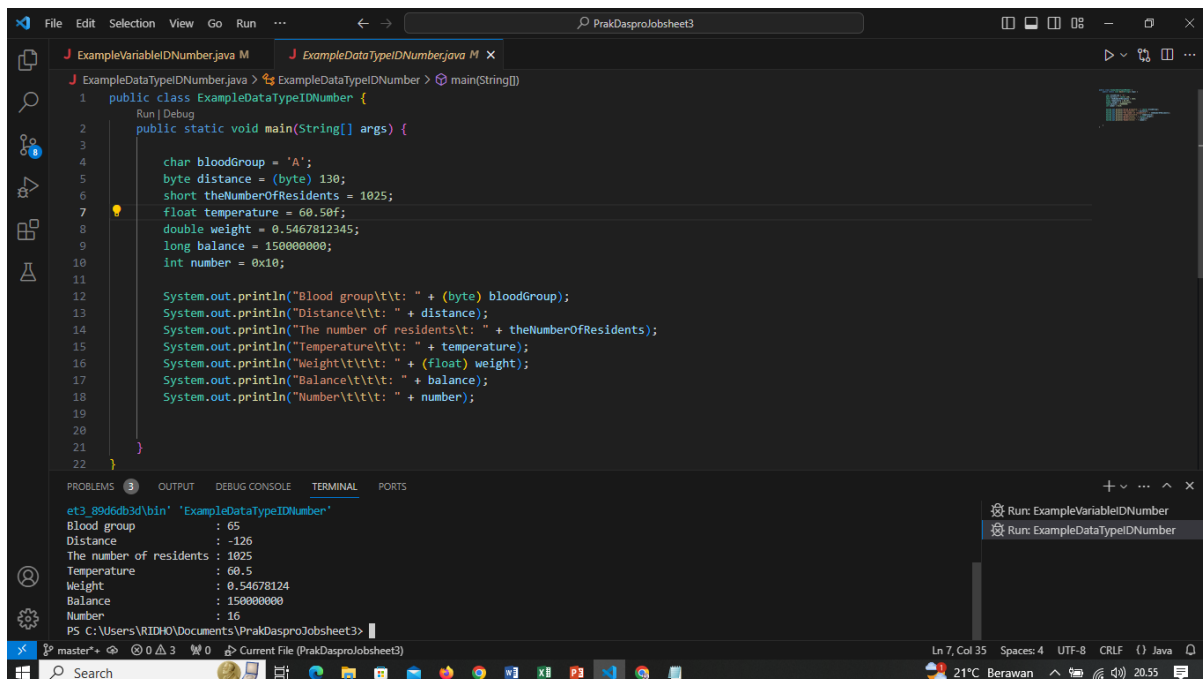
The screenshot shows an IDE with a Java file named `ExampleVariableIDNumber.java`. The code defines a class `ExampleVariableIDNumber` with a `main` method. The `main` method contains several variables: `oneOfMyHobbies` (String), `isSmart` (boolean), `gender` (char), `_age` (byte), and `$gpa` (double). It prints the values of these variables. The output window shows the following text:

```
Playing Game
Are you smart ? true
Gender: M
My current age is 18
My GPA is 3.38 and my height is 1.68 meters
```

2. What is the function of %s in the statement below? Is there anything you can use instead of %s? Name and explain it!

Answer : %s as a placeholder for strings, and there are other format specifiers like %d for integers, %f for floating-point numbers, etc., for different data types. These format specifiers can be used to format strings in a more controlled and specific manner.

Experiment 2



The screenshot shows an IDE with two tabs: 'ExampleVariableIDNumber.java' and 'ExampleDataTypeIDNumber.java'. The active tab is 'ExampleDataTypeIDNumber.java', which contains the following code:

```
1 public class ExampleDataTypeIDNumber {
2     public static void main(String[] args) {
3
4         char bloodGroup = 'A';
5         byte distance = (byte) 130;
6         short theNumberOfResidents = 1025;
7         float temperature = 60.50F;
8         double weight = 0.5467812345;
9         long balance = 150000000;
10        int number = 0x10;
11
12        System.out.println("Blood group\t\t: " + (byte) bloodGroup);
13        System.out.println("Distance\t\t: " + distance);
14        System.out.println("The number of residents\t: " + theNumberOfResidents);
15        System.out.println("Temperature\t\t: " + temperature);
16        System.out.println("Weight\t\t\t: " + (float) weight);
17        System.out.println("Balance\t\t\t: " + balance);
18        System.out.println("Number\t\t\t: " + number);
19
20    }
21 }
22
```

The output window shows the following results:

```
et3_89d6d3d\bin' 'ExampleDataTypeIDNumber'
Blood group      : 65
Distance         : -126
The number of residents : 1025
Temperature      : 60.5
Weight           : 0.54678124
Balance          : 150000000
Number           : 16
```

Questions!

1. Explain why the bloodGroup does not display an "A"!

Answer : Because the blood group whose data type is integer is changed or cast to bytes to produce the value 65, which is the value of A according to ASCII

2. Explain the meaning of byte distance = (byte) 130! Then, explain why the results change when displayed!

Answer : when you cast the integer 130 to a byte in Java using (byte) 130, it results in an overflow because bytes can only hold values in the range of -128 to 127. The binary representation of 130 in two's complement wraps around to -126, and that value is stored in the byte variable.

3. In the syntax float temperature = 60.50F; remove the letter F, then run again. What happened?

Answer : when you declare a float variable, you typically add the letter F or f at the end of the value to explicitly indicate that it's a float literal. If you remove the F from the float literal, the value is treated as a double by default.

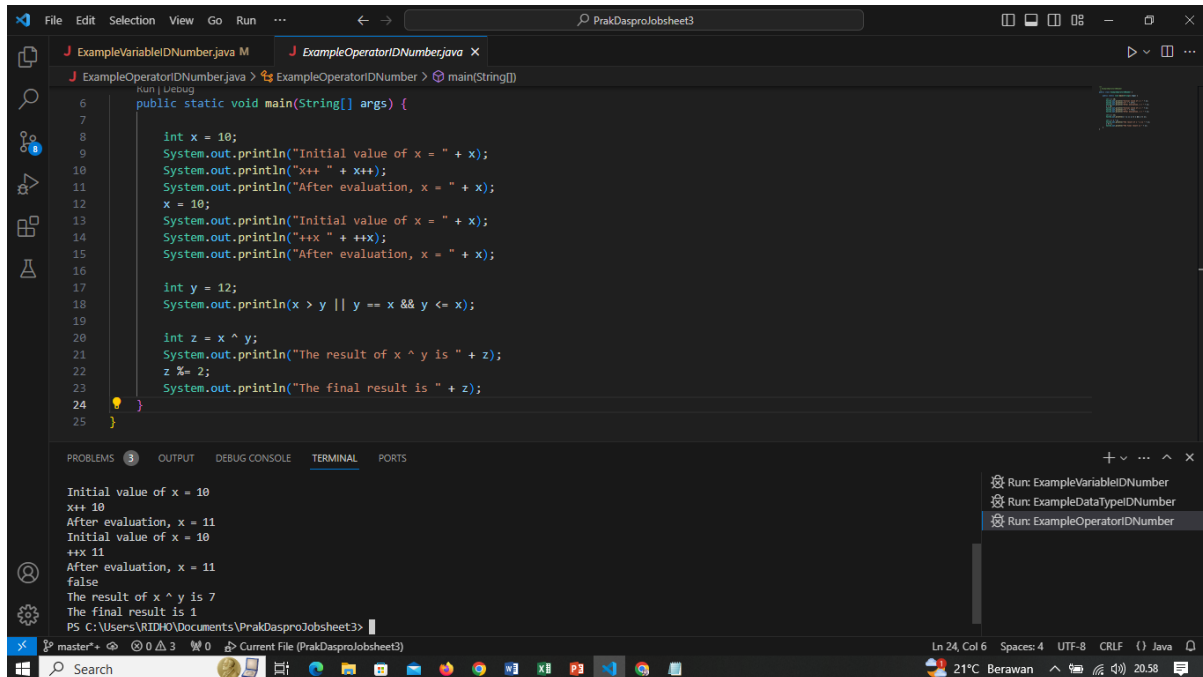
4. Why does the result change when displaying weight values?

Answer : Because in the print command the weight variable whose data type is double is changed to the float data type, where the float data type stores fewer values than the double data type which can store more values

5. Explain the meaning of initializing 0x10 on number variables! What does it do?

Answer : 0x10 is a hexadecimal number, 0x10 (hexadecimal) = 16 (decimal) Because 0x prefix represents a HexaDecimal base.

Experiment 3



The screenshot shows an IDE with two Java files: `ExampleVariableIDNumber.java` and `ExampleOperatorIDNumber.java`. The active file is `ExampleOperatorIDNumber.java`, which contains the following code:

```
public static void main(String[] args) {  
    6  
    7  
    8     int x = 10;  
    9     System.out.println("Initial value of x = " + x);  
    10    System.out.println("x++ " + x++);  
    11    System.out.println("After evaluation, x = " + x);  
    12    x = 10;  
    13    System.out.println("Initial value of x = " + x);  
    14    System.out.println("++x " + ++x);  
    15    System.out.println("After evaluation, x = " + x);  
    16  
    17    int y = 12;  
    18    System.out.println(x > y || y == x && y <= x);  
    19  
    20    int z = x ^ y;  
    21    System.out.println("The result of x ^ y is " + z);  
    22    z %= 2;  
    23    System.out.println("The final result is " + z);  
    24 }  
    25 }
```

The output window shows the following results:

```
Initial value of x = 10  
x++ 10  
After evaluation, x = 11  
Initial value of x = 10  
++x 11  
After evaluation, x = 11  
false  
The result of x ^ y is 7  
The final result is 1
```

Questions!

1. Explain in your opinion what is the difference between `x++` and `++x`!

Answer : In `x++` the value of variable is printed first then it is incremented whereas in `++x` the value is incremented first and then it is displayed.

2. What is the result of `int z = x ^ y`; do the calculations manually (you can use a calculator)!

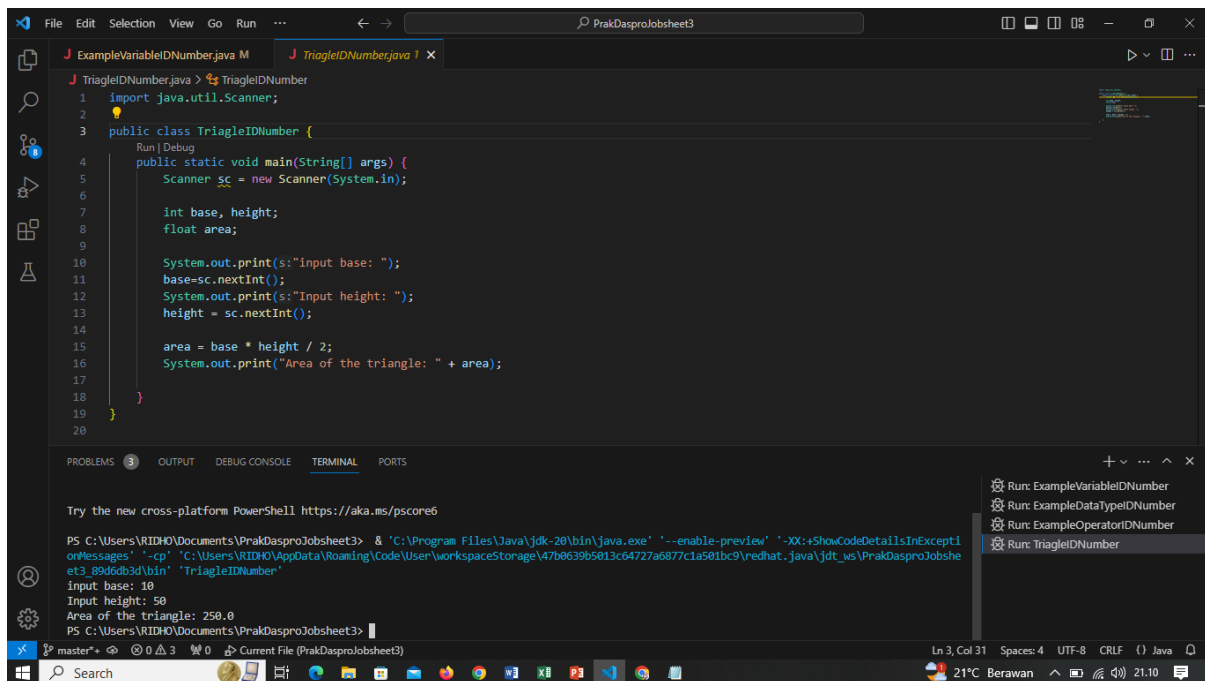
Answer : $z = x \wedge y$

$z = 11 \text{ XOR } 12$

$z = 1011 \text{ XOR } 1100$

$z = 0111 = 7$

Experiment 4



```
File Edit Selection View Go Run ...
PrakDasproJobsheet3

J ExampleVariableIDNumber.java M J TriagleIDNumber.java 1 x
J TriagleIDNumber.java > TriagleIDNumber
1 import java.util.Scanner;
2
3 public class TriagleIDNumber {
4     Run | Debug
5     public static void main(String[] args) {
6         Scanner sc = new Scanner(System.in);
7
8         int base, height;
9         float area;
10
11         System.out.print("input base: ");
12         base=sc.nextInt();
13         System.out.print("Input height: ");
14         height = sc.nextInt();
15
16         area = base * height / 2;
17         System.out.print("Area of the triangle: " + area);
18     }
19 }
20

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\RIIDHO\Documents\PrakDasproJobsheet3> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-enable-preview' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\RIIDHO\AppData\Roaming\Code\User\workspaceStorage\47b0639b5013c64727a6877c1a501bc9\nedhat_java\jdt_ws\PrakDasproJobsheet3_89d6db3d\bin' 'TriagleIDNumber'
input base: 10
Input height: 50
Area of the triangle: 250.0
PS C:\Users\RIIDHO\Documents\PrakDasproJobsheet3>

Run: ExampleVariableIDNumber
Run: ExampleDataTypedIDNumber
Run: ExampleOperatorIDNumber
Run: TriagleIDNumber

Ln 3, Col 31 Spaces: 4 UTF-8 CRLF () Java
```

Questions!

1. Explain why you have to declare Scanner in Experiment 4?

Answer : In Java, you need to declare and initialize a Scanner object before you can use it to read input from the user or from some input source, such as a file or a stream.

2. Explain the use of the program snippets below!

Answer : The program gives commands for the base and height variables so that the values can be entered manually by the user

Experiment 5

The screenshot shows an IDE window titled "PrakDasproJobsheet3" with a Java file named "BankIDNumber.java". The code defines a class "BankIDNumber" with a "main" method that uses a "Scanner" to take user input for initial savings amount and period, then calculates interest and final savings amount.

```
1 import java.util.Scanner;
2
3 public class BankIDNumber {
4     public static void main(String[] args) {
5         Scanner sc = new Scanner(System.in);
6
7         int init_sav_amount, sav_period;
8         double final_sav_amount, interest, interest_percent = 0.02;
9
10        System.out.print(s:"Input your initial savings amaount: ");
11        init_sav_amount = sc.nextInt();
12        System.out.print(s:"Input your savings period: ");
13        sav_period = sc.nextInt();
14
15        interest = sav_period * interest_percent * init_sav_amount;
16        final_sav_amount = interest + init_sav_amount;
17
18        System.out.println("Interest: "+ interest);
19        System.out.println("Final saving amount: "+ final_sav_amount);
20    }
21 }
```

The terminal output shows the execution of the program with the following input and output:

```
PS C:\Users\RIDHO\Documents\PrakDasproJobsheet3> cd 'c:\Users\RIDHO\Documents\PrakDasproJobsheet3'; & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-enable-preview' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\RIDHO\AppData\Roaming\Code\User\workspaceStorage\47d0639b5013c64727a6877c1a501bc9\redhat.java\jdt_ws\PrakDasproJobsheet3_89d6db3d\bin' 'BankIDNumber'
Input your initial savings amount: 5.000.000
Input your savings period: 5
Interest: 500000.0
Final saving amount: 5500000.0
PS C:\Users\RIDHO\Documents\PrakDasproJobsheet3>
```

The bottom status bar indicates the current file is "PrakDasproJobsheet3" and the cursor is at line 7, column 41. The system tray shows the temperature as 22°C and the time as 21:38.

Assignment

1. Do assignments according to your group's final project topic!

- a. Identify input, output, processes based on the scope of each group's final project topic. The processes identified are limited to processes that use arithmetic operators.

Answer :

a. Input :

1. Applicant's Personal Data
2. Loan Purpose
3. Requested Loan Amount
4. Loan Term

b. Output :

1. Loan Decision
2. Credit Report
3. Transaction Records

c. Process :

1. Loan Application
2. Identity Verification
3. Approval or Rejection
4. Loan Disbursement
5. Loan Repayment
6. Credit Reporting

- b. Identify variables and data types based on input, output, and process according to project topic based on 1a.

Answer :

Int = Applicant's Personal Data, Loan Purpose, Loan Decision, Approval or Rejection, Identity Verification,

Double = Requested Loan Amount, Loan Term, Transaction Records, Loan Repayment