

Practicum Report

Job sheet 3

Assignment 3: Experiment Variables, Data Types, and Operators



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INFORMATICS ENGINEERING

INFORMATICS TECHNOLOGY

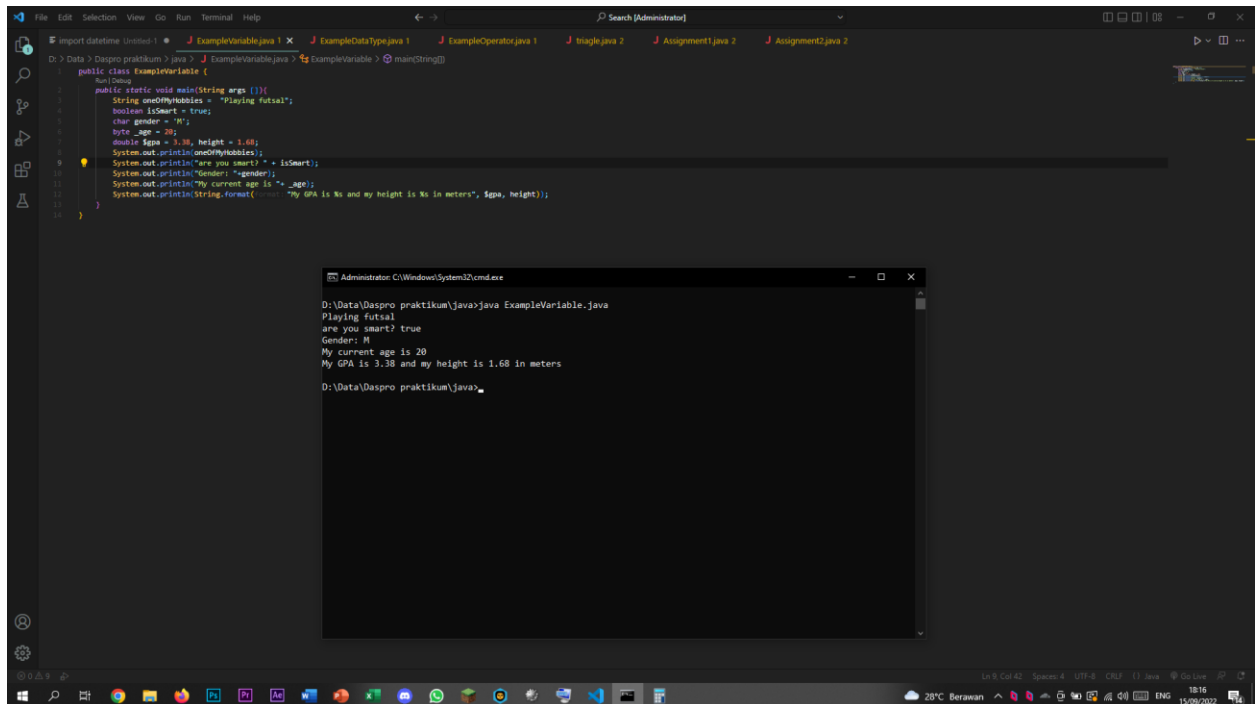
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Experiment 1

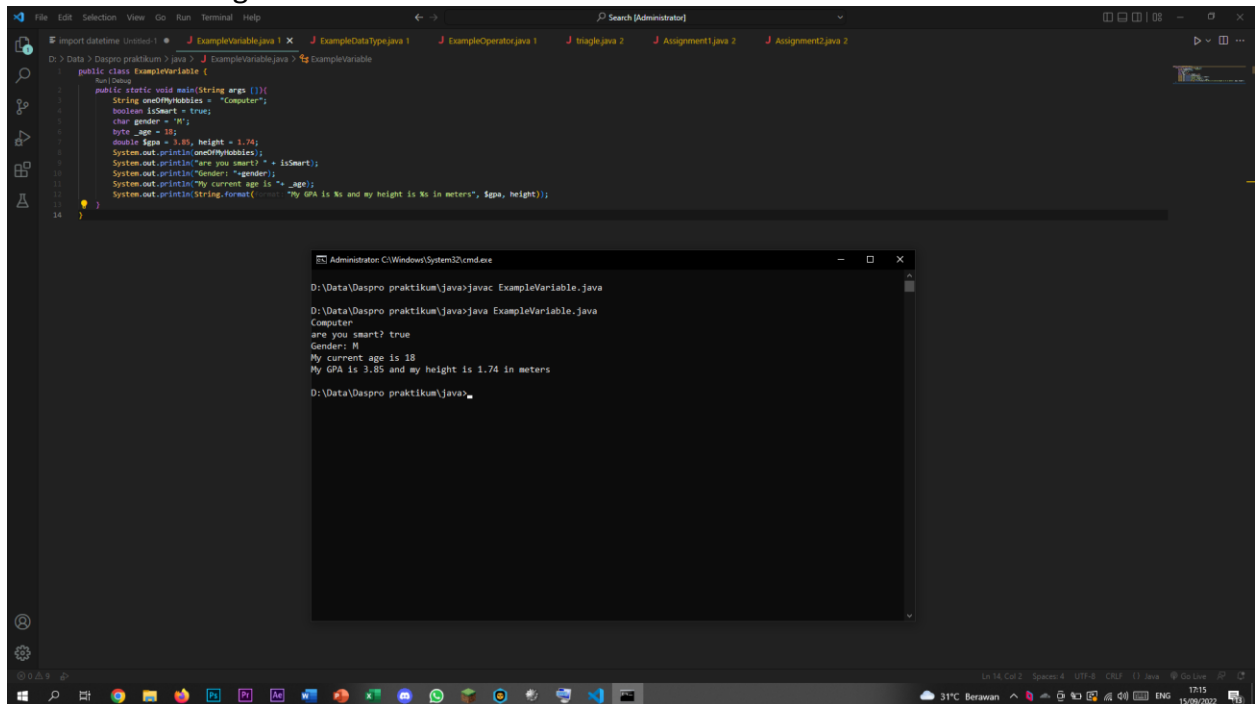
1. Change the variable name so that the variable naming model is good and correct!



```
public class ExampleVariable {  
    // TODO  
    public static void main(String args []) {  
        String oneOfMyHobbies = "Playing futsal";  
        boolean isSmart = true;  
        char gender = 'M';  
        byte age = 20;  
        double Gpa = 3.38, height = 1.68;  
        System.out.println(oneOfMyHobbies);  
        System.out.println("are you smart? " + isSmart);  
        System.out.println("Gender: " + gender);  
        System.out.println("My current age is " + age);  
        System.out.println(String.format("My GPA is %s and my height is %s in meters", Gpa, height));  
    }  
}
```

```
D:\Data\Daspro praktikum\java>java ExampleVariable.java  
Playing futsal  
are you smart? true  
Gender: M  
My current age is 20  
My GPA is 3.38 and my height is 1.68 in meters  
D:\Data\Daspro praktikum\java>
```

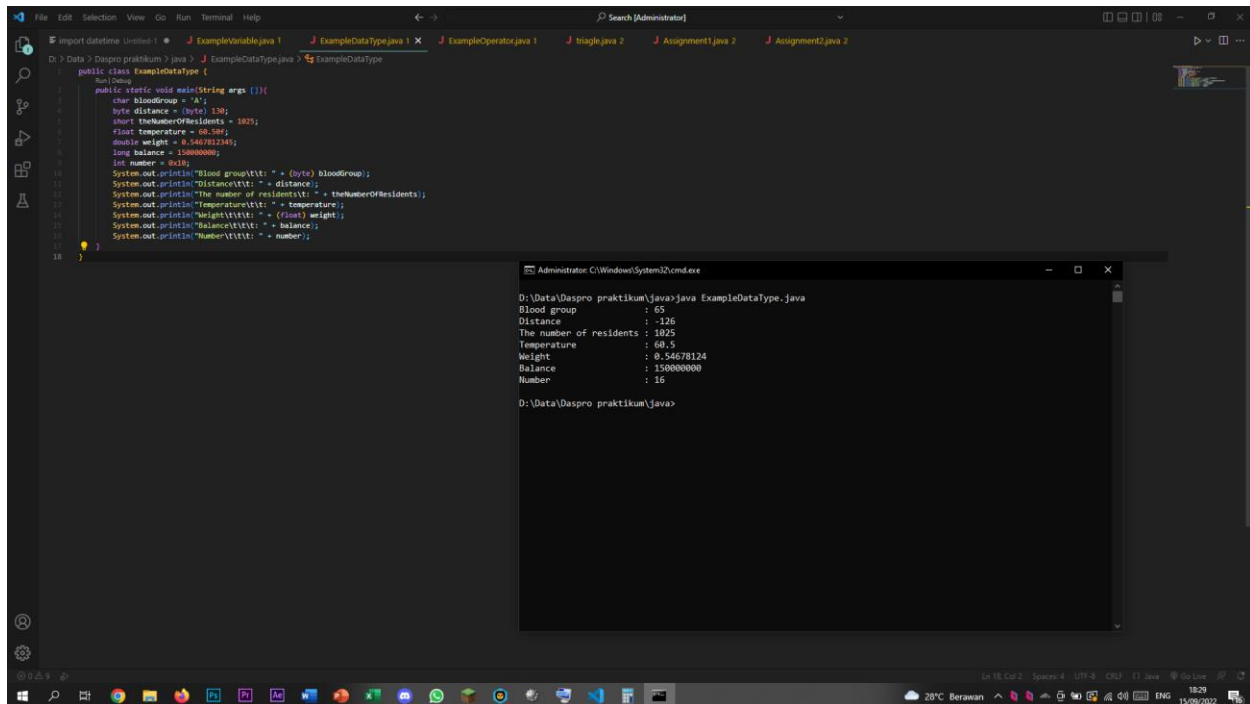
2. Run the code again and then observe the results!



```
public class ExampleVariable {  
    // TODO  
    public static void main(String args []) {  
        String myHobbies = "Computer";  
        boolean isSmart = true;  
        char gender = 'M';  
        byte age = 18;  
        double gpa = 3.85, height = 1.74;  
        System.out.println(myHobbies);  
        System.out.println("are you smart? " + isSmart);  
        System.out.println("Gender: " + gender);  
        System.out.println("My current age is " + age);  
        System.out.println(String.format("My GPA is %s and my height is %s in meters", gpa, height));  
    }  
}
```

```
D:\Data\Daspro praktikum\java>javac ExampleVariable.java  
D:\Data\Daspro praktikum\java>java ExampleVariable.java  
Computer  
are you smart? true  
Gender: M  
My current age is 18  
My GPA is 3.85 and my height is 1.74 in meters  
D:\Data\Daspro praktikum\java>
```

Experiment 2



The screenshot shows an IDE with a Java file named `ExampleDataType.java`. The code defines a class with a `main` method that prints various data types. The output window shows the results of running the program.

```
import datetime;
import datetime;

public class ExampleDataType {
    public static void main(String args[]) {
        char bloodGroup = 'A';
        byte distance = (byte) 130;
        short theNumberofResidents = 1025;
        float temperature = 60.50F;
        double weight = 0.54678124;
        long balance = 150000000;
        int number = 10;

        System.out.println("Blood group\t\t: " + (byte) bloodGroup);
        System.out.println("Distance\t\t: " + distance);
        System.out.println("The number of residents\t\t: " + theNumberofResidents);
        System.out.println("Temperature\t\t: " + temperature);
        System.out.println("Weight\t\t\t: " + (float) weight);
        System.out.println("Balance\t\t\t: " + balance);
        System.out.println("Number\t\t\t: " + number);
    }
}
```

Output:

```
D:\Data\Daspro praktikum\java>java ExampleDataType.java
Blood group      : 65
Distance         : -126
The number of residents : 1025
Temperature      : 60.5
Weight           : 0.54678124
Balance          : 150000000
Number           : 10
D:\Data\Daspro praktikum\java>
```

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

Answer:

Because the blood group was change in the printing process into byte.

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

Answer:

Because when an integer was turned into byte and the integer lies out of range of byte range, the byte will cycle back to the start of the byte range.

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

Answer:

```
import datetime;
public class ExampleDataType {
    public static void main(String args[]) {
        char bloodGroup = 'A';
        byte distance = (byte) 130;
        short theNumberofResidents = 1000;
        float temperature = 60.5f;
        double weight = 0.5467812345;
        long balance = 1500000000L;
        int number = 10;
        System.out.println("Blood group is: " + (byte) bloodGroup);
        System.out.println("Distance is: " + distance);
        System.out.println("The number of residents is: " + theNumberofResidents);
        System.out.println("Temperature is: " + temperature);
        System.out.println("Weight is: " + (float) weight);
        System.out.println("Balance is: " + balance);
        System.out.println("Number is: " + number);
    }
}
```

```
D:\Data\Daspro praktikum\java>java ExampleDataType.java
Blood group : 65
Distance : 126
The number of residents : 1000
Temperature : 60.5
Weight : 0.54678124
Balance : 1500000000
Number : 10
D:\Data\Daspro praktikum\java>java ExampleDataType.java
ExampleDataType.java:6: error: incompatible types: possible lossy conversion from double to float
    float temperature = 60.5;
                        ^
1 error
error: compilation failed
D:\Data\Daspro praktikum\java>
```

An error occurred, because it can't tell the difference between double and float. A float number is indicated by number followed by f.

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

Answer:

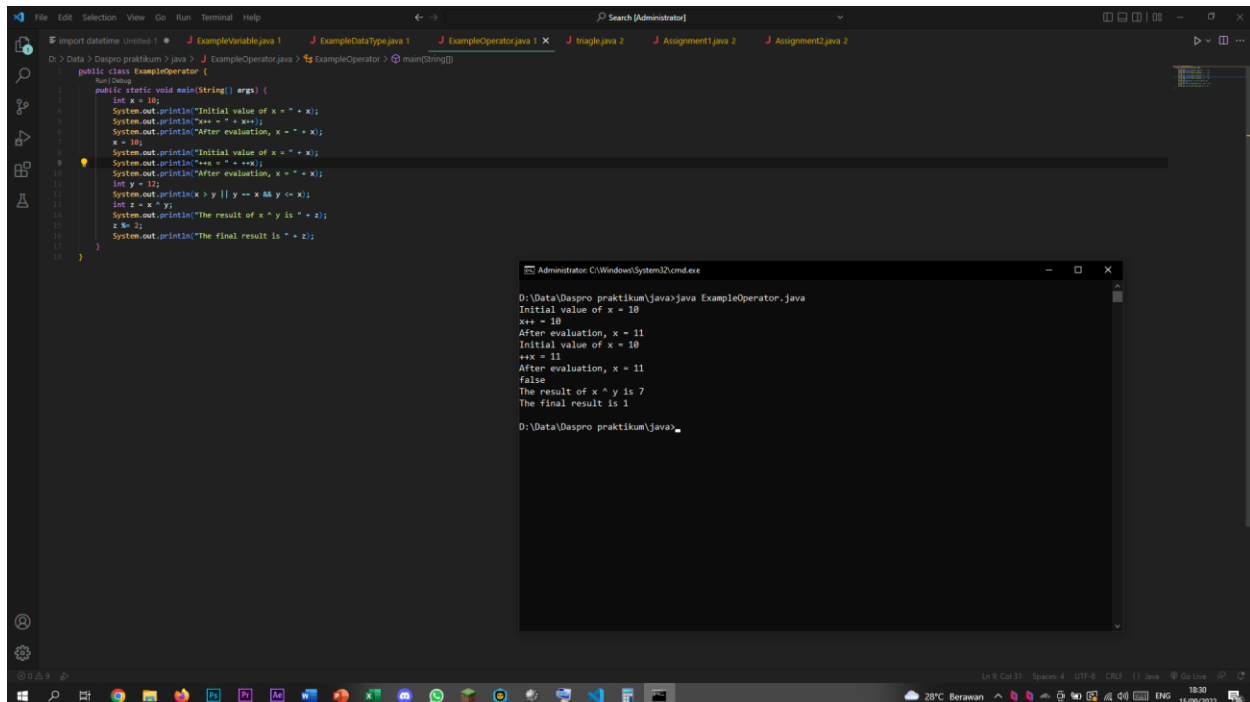
Because in the process of printing, the weight was converted to float, which has a lower integer limit than double.

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

Answer:

0x10 is a hexadecimal number, when a hexadecimal number (initiated by 0x-) was defined as an integer, it will convert the format from hexadecimal to decimal integer.

Experiment 3



The screenshot shows an IDE with a Java file named `ExampleOperator.java`. The code defines a `main` method that performs several operations on variables `x` and `y`. A terminal window displays the output of the program.

```
public class ExampleOperator {  
    public static void main(String[] args) {  
        int x = 10;  
        System.out.println("Initial value of x = " + x);  
        System.out.println("x++ = " + x++);  
        System.out.println("After evaluation, x = " + x);  
        x = 10;  
        System.out.println("Initial value of x = " + x);  
        System.out.println("x++ = " + ++x);  
        System.out.println("After evaluation, x = " + x);  
        int y = 12;  
        System.out.println(x > y || y == x && y <= x);  
        int z = x ^ y;  
        System.out.println("The result of x ^ y is " + z);  
        z &= 1;  
        System.out.println("The final result is " + z);  
    }  
}
```

Output:

```
D:\Data\Daspro praktikum\java>java ExampleOperator.java  
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  
D:\Data\Daspro praktikum\java>
```

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

Answer:

`x++` add up the number after declaring it meaning that it actually displays the previous value first and then adding up later, `++x` does the opposite, it adds up immediately instead of adding up later, meaning that the value added up first then it displayed the added-up value.

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

Answer:

$Z = X \oplus Y$

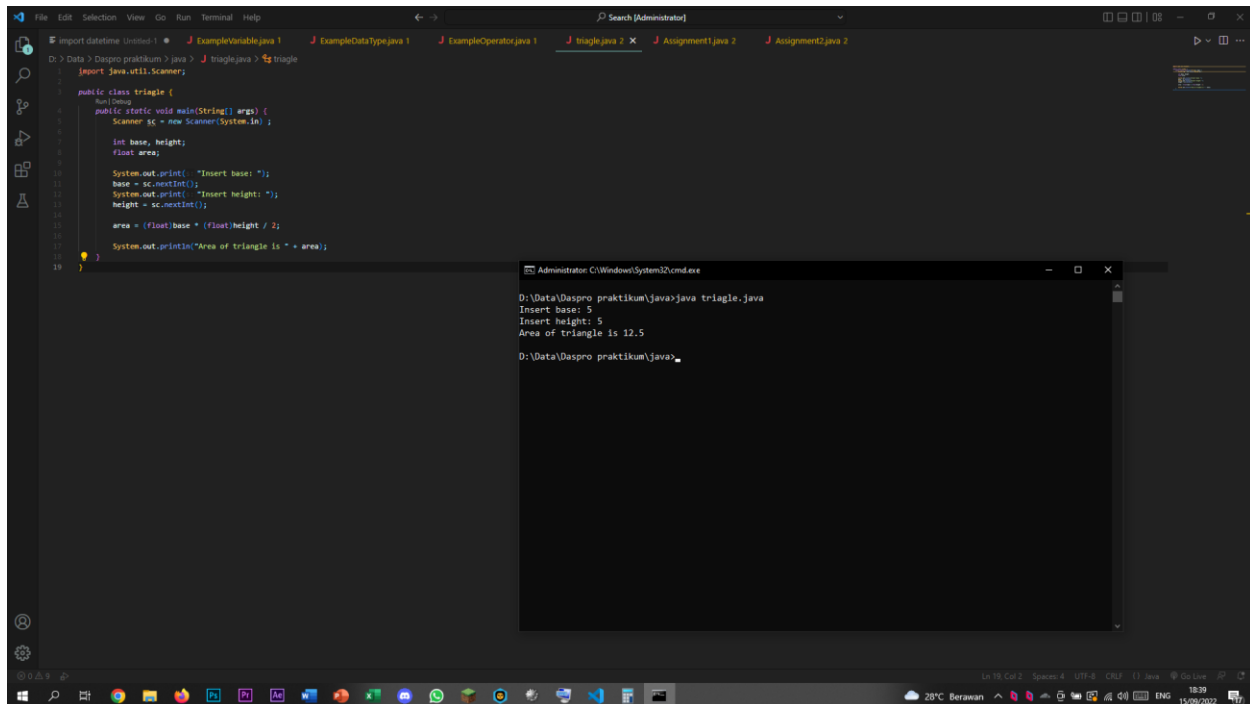
$X = 11$ in binary is 1011

$Y = 12$ in binary is 1100

Passing X and Y through bitwise XOR operator would result in 0111 which is 7

In which the remainder of 7 divided by 2 is 1

Experiment 4



```
import java.util.Scanner;

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

        int base, height;
        float area;

        System.out.print("Insert base: ");
        base = sc.nextInt();
        System.out.print("Insert height: ");
        height = sc.nextInt();

        area = (float)base * (float)height / 2;

        System.out.println("Area of triangle is " + area);
    }
}
```

```
D:\Data\Daspro praktikum\java>java triangle.java
Insert base: 5
Insert height: 5
Area of triangle is 12.5
D:\Data\Daspro praktikum\java>
```

1. Explain why the float data type is used for the variable area!

Answer:

Because the result of the calculation may result in fractional decimal number.