

## Tutorial 05

### Expressions | Operators | Conditional Statements

#### Exercise 1:

Convert each of the following phrases to a Java boolean expression as in the first example:

English expression	Java expression
1. whether x is positive	$x > 0$
2. whether x is a multiple of y	
3. whether x is between -2 and 13	
4. whether the difference between x and y is less than 5	
5. whether x is not between 5 and 27	
6. whether x has more than 4 digits	
7. whether x has exactly 6 digits	

#### Exercise 2:

Write a Java program that prompts the user to enter the width and the length for a rectangle, then to enter the width and the length for a second rectangle, and finally it displays a message stating which rectangle (the first or the second) has greater area. (Note: there are three cases)

#### Exercise 3

Write a Java program that prompts the user to enter two positive integers, then displays whether the first is a multiple of the second or not.

#### Exercise 4

Rewrite the following Java program replacing if-else statement with if-then statements.

```
import java.util.Scanner;
class Ex4 {
    public static void main(String[] args) {
        Scanner SC = new Scanner(System.in);
        System.out.print("Please enter your age: ");
        int age = SC.nextInt();
        if (age >= 13 && age <= 60)
            System.out.println("You can proceed.");
        else
            System.out.println("Your age does not qualify you to
process");
    }
}
```

#### Exercise 5

Trace the following two code fragments for  $a = +3$ ,  $a = 0$ ,  $a = -5$ , then tell whether these fragments

are equivalent or not.

**A.**

```
if (a < 0) {
    System.out.println("Negative");
    a = a * -1;
    System.out.println("Absolute value is: " + a);
}
else {
    System.out.println("Positive");
    System.out.println("Absolute value is: " + a);
}
```

**B.**

```
if (a < 0) {
    System.out.println("Negative");
    a = a * -1;
    System.out.println("Absolute value is: " + a);
}
if (a >= 0) {
    System.out.println("Positive");
    System.out.println("Absolute value is: " + a);
}
```

## Tutorial 05 Solutions

### Exercise 1:

1.  $x > 0$
2.  $2x \% y == 0$
3.  $3x \geq -2 \ \&\& \ x \leq 13$
4.  $4x - y < 5 \ || \ y - x < 5$   
or  
 $x - y < 5 \ || \ x - y > -5$   
or  
 $\text{Math.abs}(x - y) < 5$
5.  $5 \ !(x \geq 5 \ \&\& \ x \leq 27)$   
or  
 $x < 5 \ || \ x > 27$
6.  $6x \geq 10000$   
or  
 $\text{Math.log10}(x) \geq 4$
7.  $7x \geq 100000 \ \&\& \ x < 1000000$   
or  
 $(\text{int})\text{Math.log10}(x) == 5$

### Exercise 2:

```
import java.util.Scanner;
class Ex2 {
    public static void main(String[] args) {
        Scanner KB = new Scanner(System.in);
        System.out.print("Enter length for rectangle 1: ");
        int length1 = KB.nextInt();
        System.out.print("Enter width for rectangle 1: ");
        int width1 = KB.nextInt();
        System.out.print("Enter length for rectangle 2: ");
        int length2 = KB.nextInt();
        System.out.print("Enter width for rectangle 2: ");
        int width2 = KB.nextInt();
        if (length1*width1 > length2*width2)
            System.out.println(Rectangle 1 has bigger area);
        if (length1*width1 < length2*width2)
            System.out.println(Rectangle 2 has bigger area);
        if (length1*width1 == length2*width2)
            System.out.println(Rectangles have same area);
    }
}
```

### Exercise 3:

```
import java.util.Scanner;
class Ex3 {
    public static void main(String[] args) {
```

```

Scanner SC = new Scanner(System.in);
System.out.print("Please enter the first number: ");
int num1 = SC.nextInt();
System.out.print("Please enter the second number: ");
int num2 = SC.nextInt();
if (num1 % num2 == 0)
    System.out.println(num1 + " is a multiple of " + num2);
else
    System.out.println(num1 + " is not a multiple of " + num2);
}
}

```

#### Exercise 4:

```

import java.util.Scanner;
class Ex4 {
    public static void main(String[] args) {
        Scanner SC = new Scanner(System.in);
        System.out.print("Please enter your age: ");
        int age = SC.nextInt();
        if (age >= 13 && age <= 60)
            System.out.println("You can proceed.");
        If (age < 13 || age > 60)
            System.out.println("Your age does not qualify you to
process");
    }
}

```

#### Exercise 5:

##### A.

a = +3      Positive  
             Absolute value is: 3

a = 0        Positive  
             Absolute value is: 0

a = -5       Negative  
             Absolute value is: 5

##### B.

a = +3       Positive  
             Absolute value is: 3

a = 0        Positive  
             Absolute value is: 0

a = -5       Negative  
             Absolute value is: 5  
             Positive  
             Absolute value is: 5