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.

```java
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.
```java
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.
```java
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. `2 x % y == 0`
3. `3 x >= -2 && x <= 13`
4. `4 x - y < 5 || y - x < 5`
   or
   `x - y < 5 || x - y > -5`
   or
   `Math.abs(x - y) < 5`
5. `5 !(x >= 5 && x <= 27)`
   or
   `x < 5 || x > 27)`
6. `6 x >= 10000`
   or
   `Math.log10(x) >= 4`
7. `7 x>=100000 && x<1000000`
   or
   `(int)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