3주차: Java programming

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차례

- 자료형
- 변수
- 연산자
- 비트 연산자

Java Variables

- Variables are containers for storing data values

- **Types** of variables
  - String
    - stores text, such as "Hello“
    - String values are surrounded by double quotes
  - int
    - stores integers (whole numbers), without decimals, such as 123 or -123
  - float
    - stores floating point numbers, with decimals, such as 19.99 or -19.99
  - char
    - stores single characters, such as 'a' or 'B‘
    - Char values are surrounded by single quotes
  - boolean
    - stores values with two states: true or false

[REF] https://www.w3schools.com/java/java_variables.asp

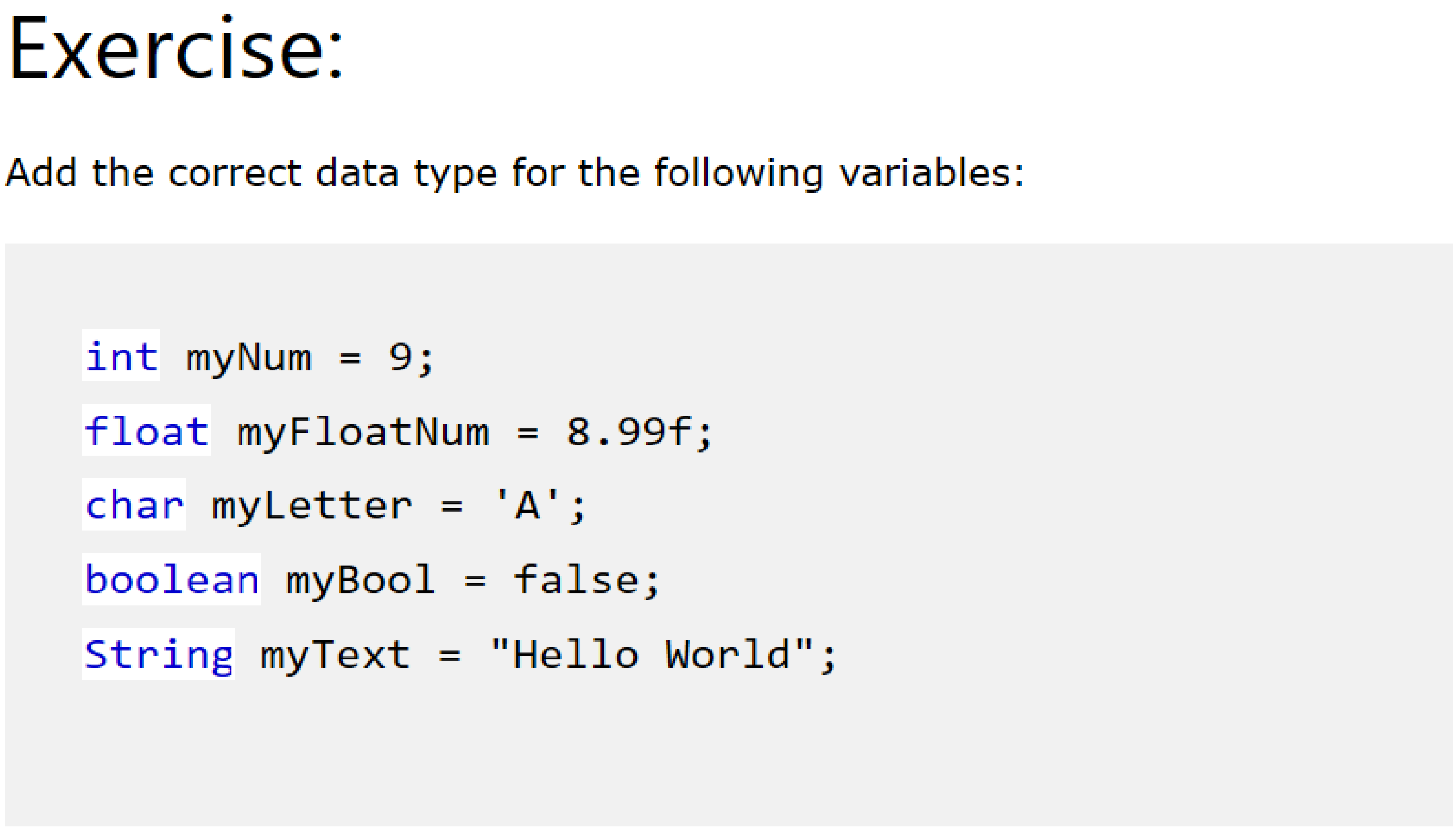
Declaring (Creating) Variables

- Syntax

type variable = value;

- Example

```
String name = "John";
System.out.println(name);

int myNum = 15;
System.out.println(myNum);
```



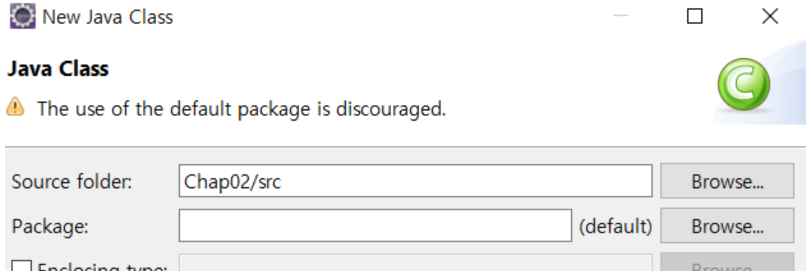
Exercise:

Add the correct data type for the following variables:

```
int myNum = 9;
float myFloatNum = 8.99f;
char myLetter = 'A';
boolean myBool = false;
String myText = "Hello World";
```

https://www.w3schools.com/java/exercise.asp?filename=exercise_data_types1

Lab. Eclipse



New Java Class

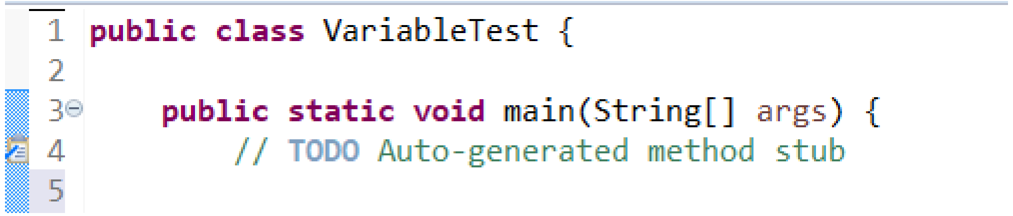
Java Class

⚠ The use of the default package is discouraged.

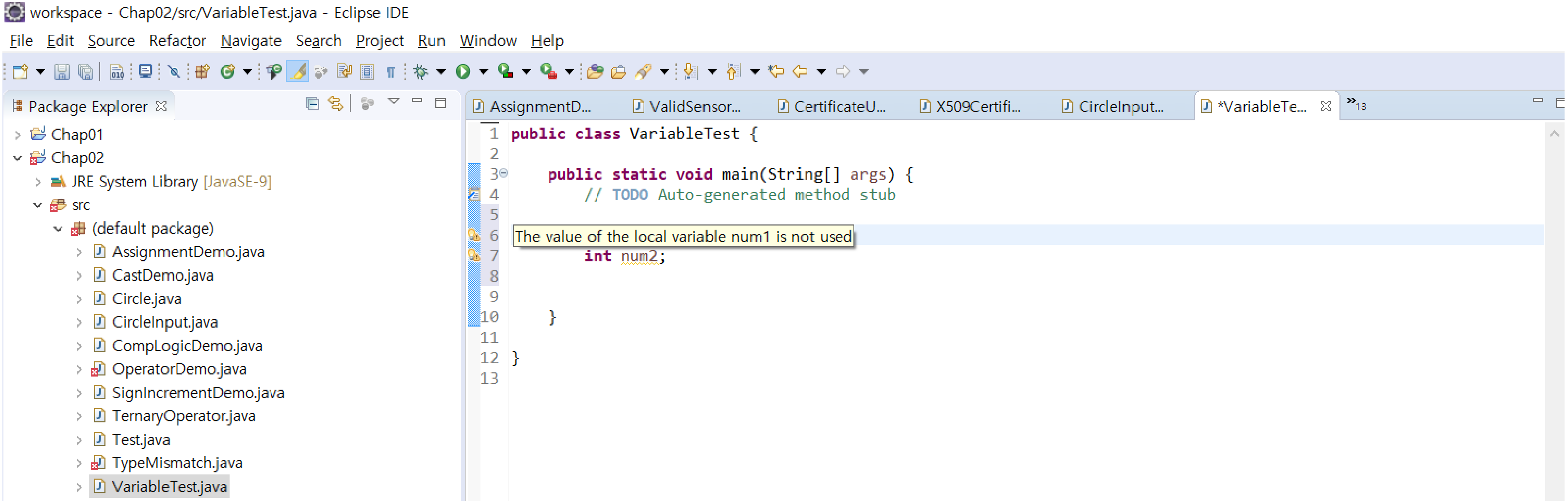
Source folder: Chap02/src [Browse...]

Package: (default) [Browse...]

□ Enclosing type: [Browse...]



```
public class VariableTest {

    public static void main(String[] args) {
        // TODO Auto-generated method stub

```

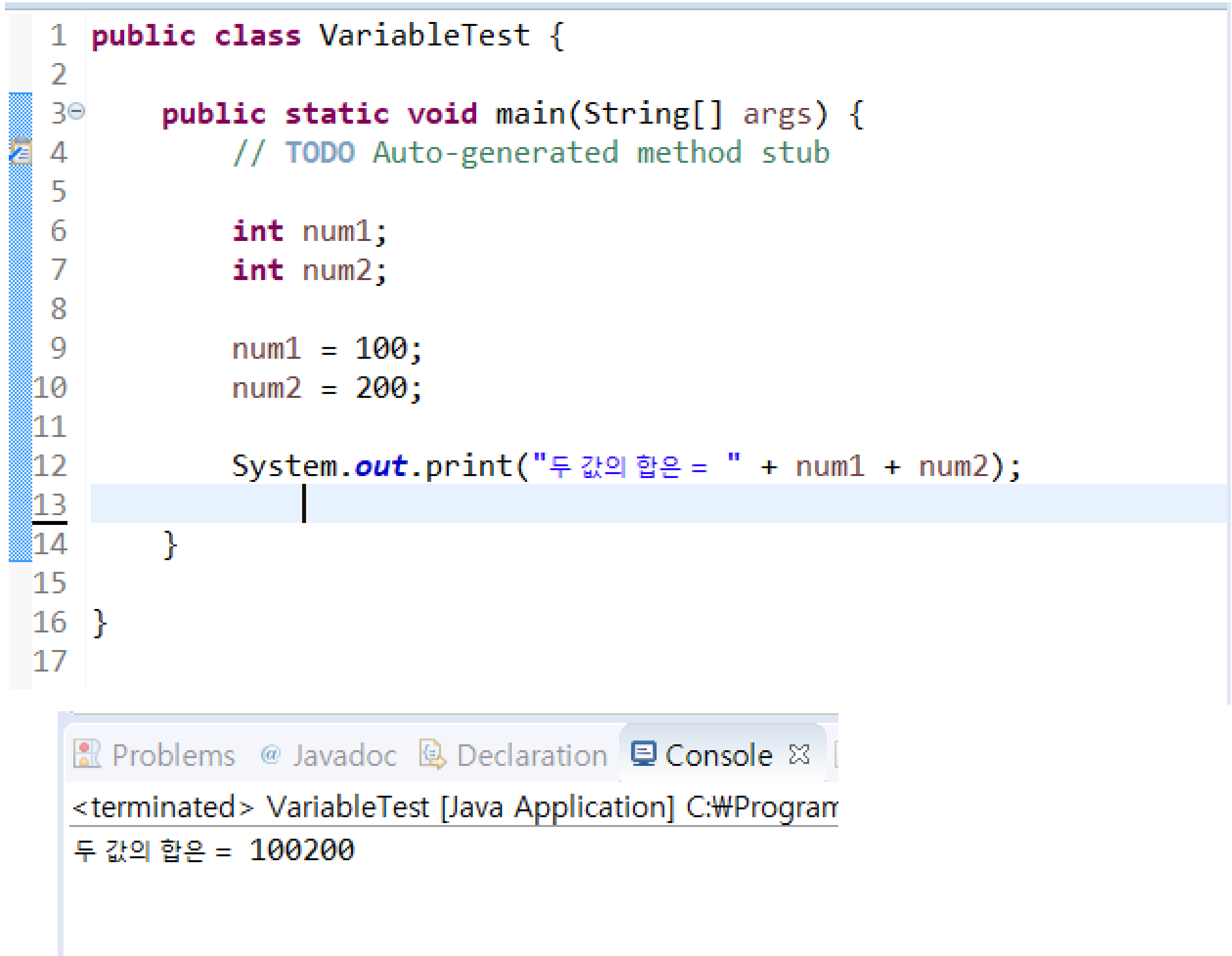


workspace - Chap02/src/VariableTest.java - Eclipse IDE

- Chap01
- Chap02
  - JRE System Library [JavaSE-9]
  - src
    - (default package)
      - AssignmentDemo.java
      - CastDemo.java
      - Circle.java
      - CircleInput.java
      - CompLogicDemo.java
      - OperatorDemo.java
      - SignIncrementDemo.java
      - TernaryOperator.java
      - Test.java
      - TypeMismatch.java
      - VariableTest.java

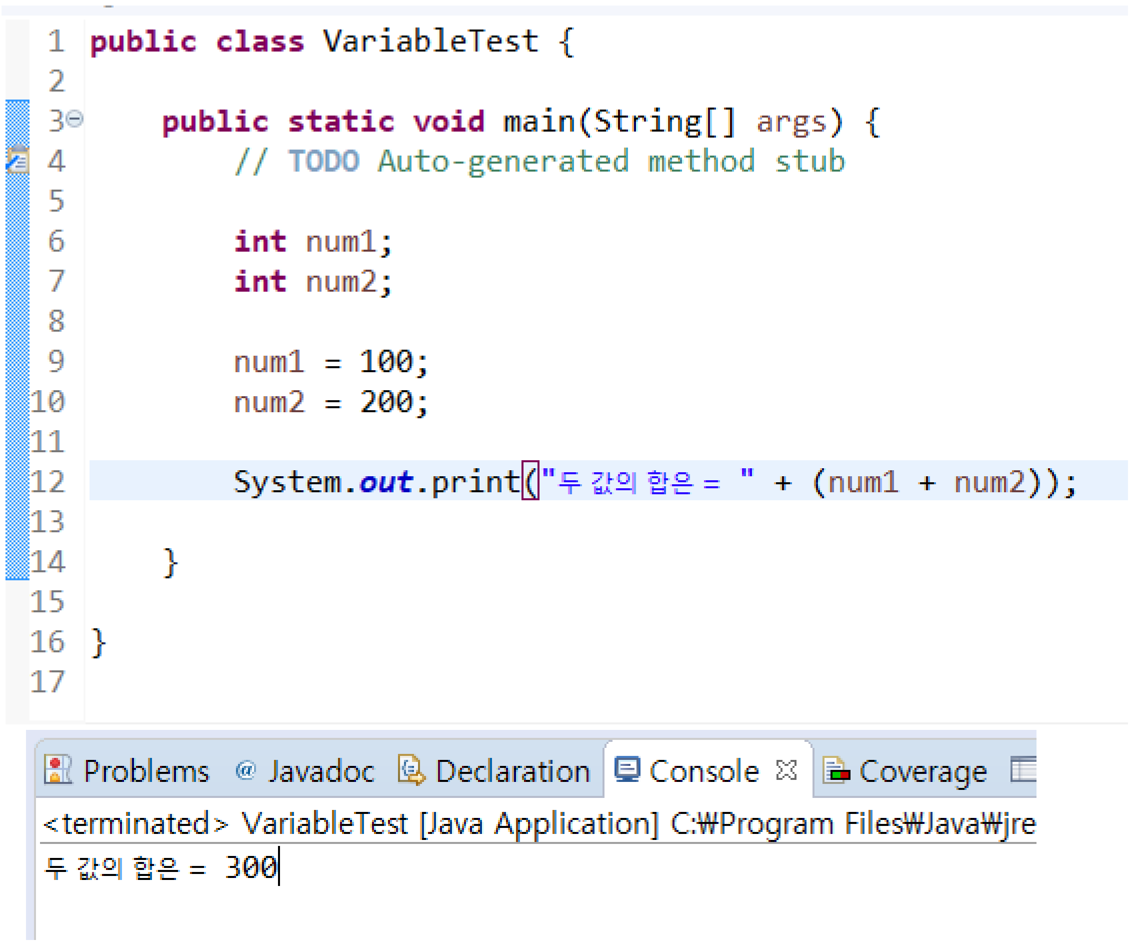
```
public class VariableTest {

    public static void main(String[] args) {
        // TODO Auto-generated method stub

The value of the local variable num1 is not used
        int num2;



    }

}

```

Lab. Eclipse



```java
public class VariableTest {

    public static void main(String[] args) {
        // TODO Auto-generated method stub

        int num1;
        int num2;

        num1 = 100;
        num2 = 200;

        System.out.print("두 값의 합은 = " + num1 + num2);

    }

}
```

```
<terminated> VariableTest [Java Application] C:₩Program
두 값의 합은 = 100200
```



```java
public class VariableTest {

    public static void main(String[] args) {
        // TODO Auto-generated method stub

        int num1;
        int num2;

        num1 = 100;
        num2 = 200;

        System.out.print("두 값의 합은 = " + (num1 + num2));

    }

}
```

```
<terminated> VariableTest [Java Application] C:₩Program Files₩Java₩jre
두 값의 합은 = 300
```

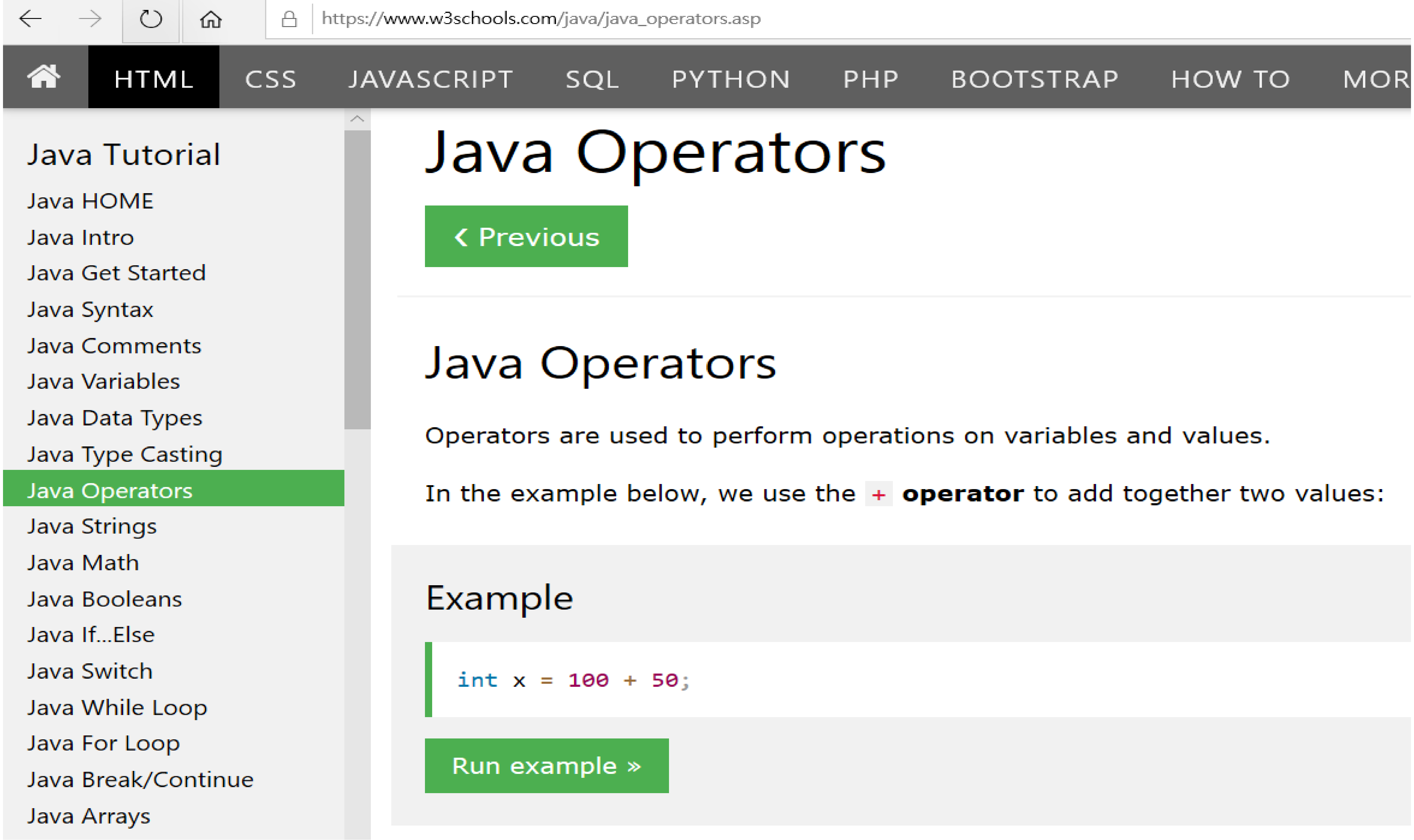
Java Operators

- Operators are used to perform operations on variables and values

- Ex) add together two values:

```
int sum = num1 + num2;
```

https://www.w3schools.com/java/java_operators.asp



Java Operators

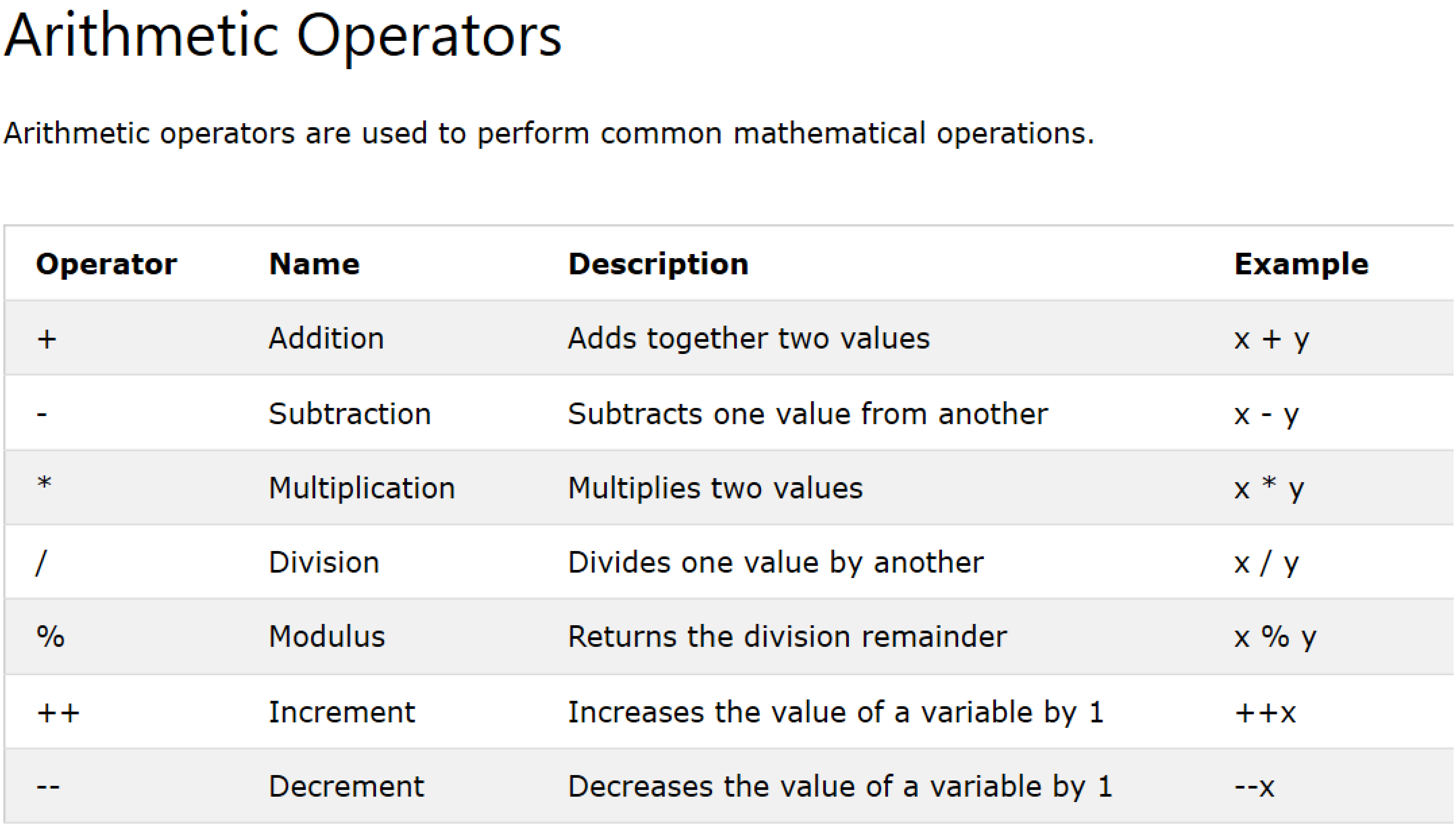
Java Operators

Operators are used to perform operations on variables and values.

In the example below, we use the `+` **operator** to add together two values:

Example

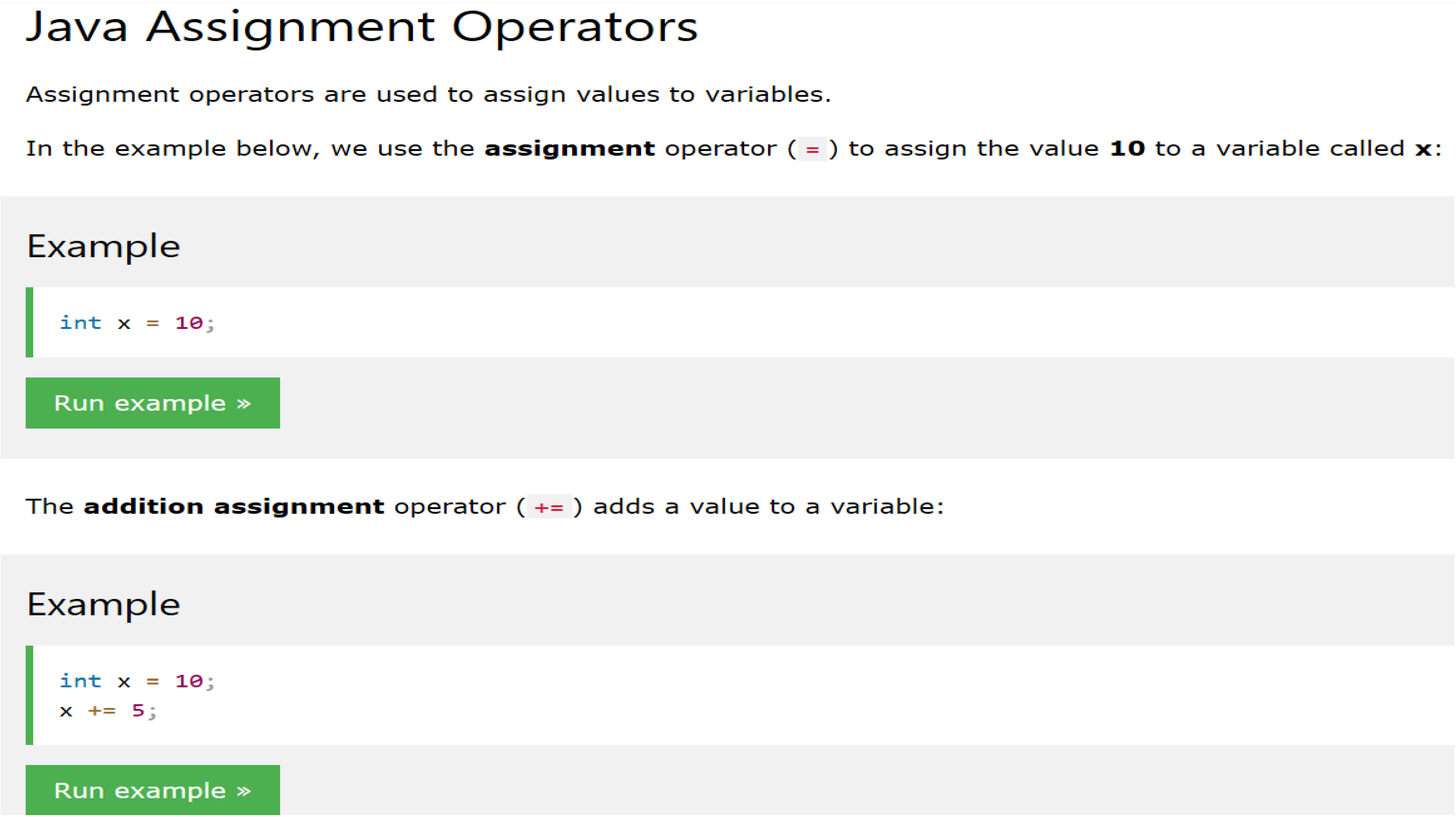
```
int x = 100 + 50;
```



Arithmetic Operators

Arithmetic operators are used to perform common mathematical operations.

Operator	Name	Description	Example
+	Addition	Adds together two values	x + y
-	Subtraction	Subtracts one value from another	x - y
*	Multiplication	Multiplies two values	x * y
/	Division	Divides one value by another	x / y
%	Modulus	Returns the division remainder	x % y
++	Increment	Increases the value of a variable by 1	++x
--	Decrement	Decreases the value of a variable by 1	--x



Java Assignment Operators

Assignment operators are used to assign values to variables.

In the example below, we use the **assignment** operator (`=`) to assign the value **10** to a variable called **x**:

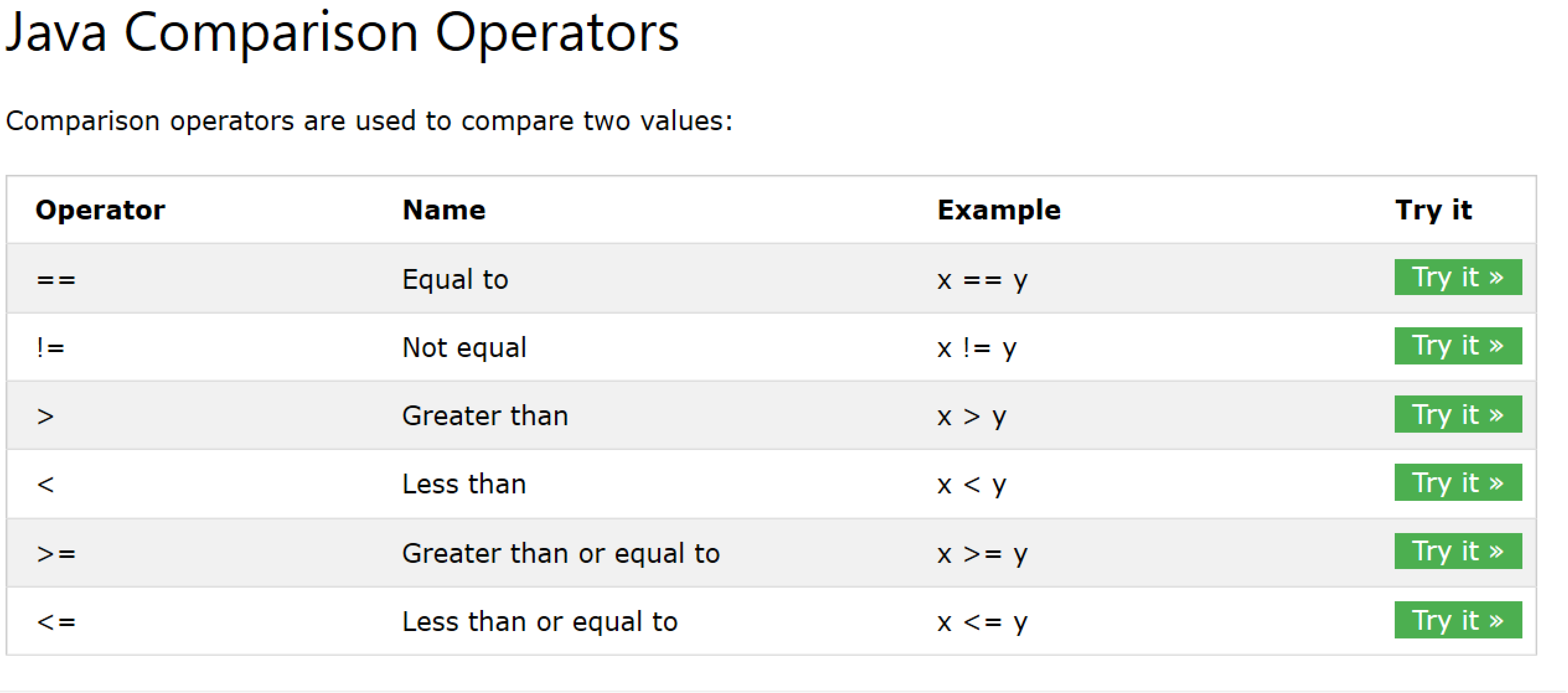
Example

```
int x = 10;
```

The **addition assignment** operator (`+=`) adds a value to a variable:

Example

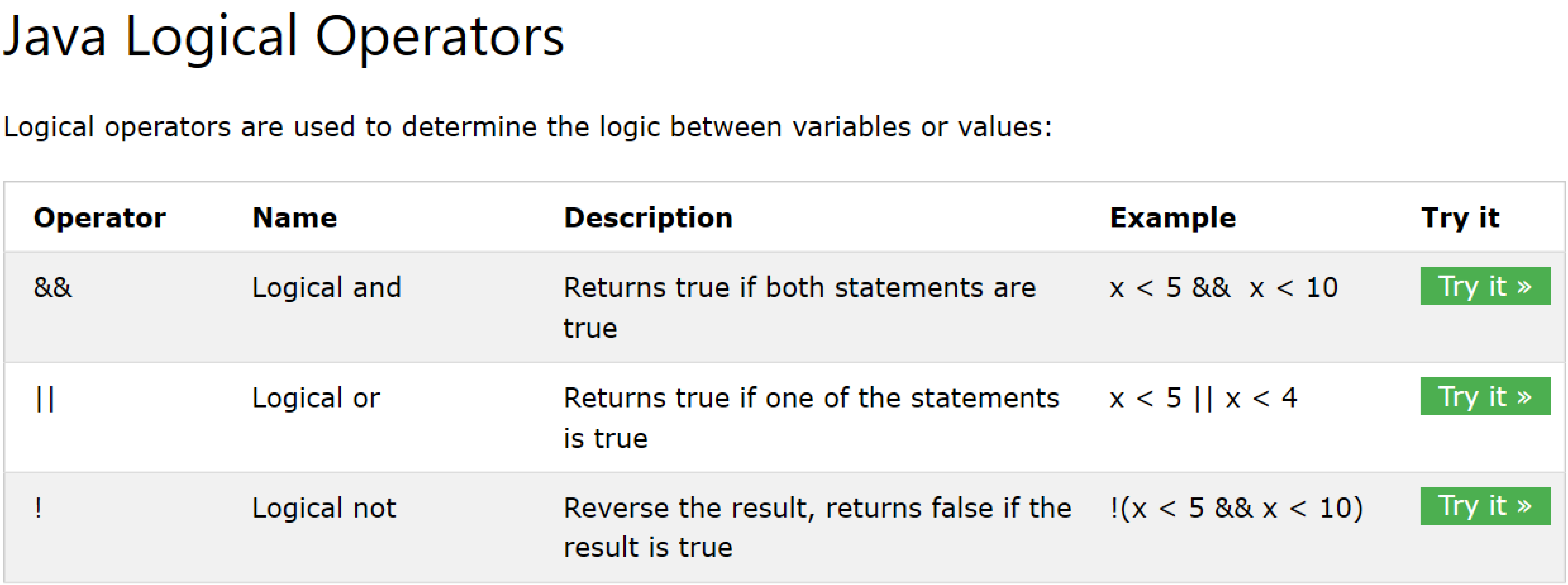
```
int x = 10;
x += 5;
```



Java Comparison Operators

Comparison operators are used to compare two values:

Operator	Name	Example	Try it
==	Equal to	x == y	Try it »
!=	Not equal	x != y	Try it »
>	Greater than	x > y	Try it »
<	Less than	x < y	Try it »
>=	Greater than or equal to	x >= y	Try it »
<=	Less than or equal to	x <= y	Try it »

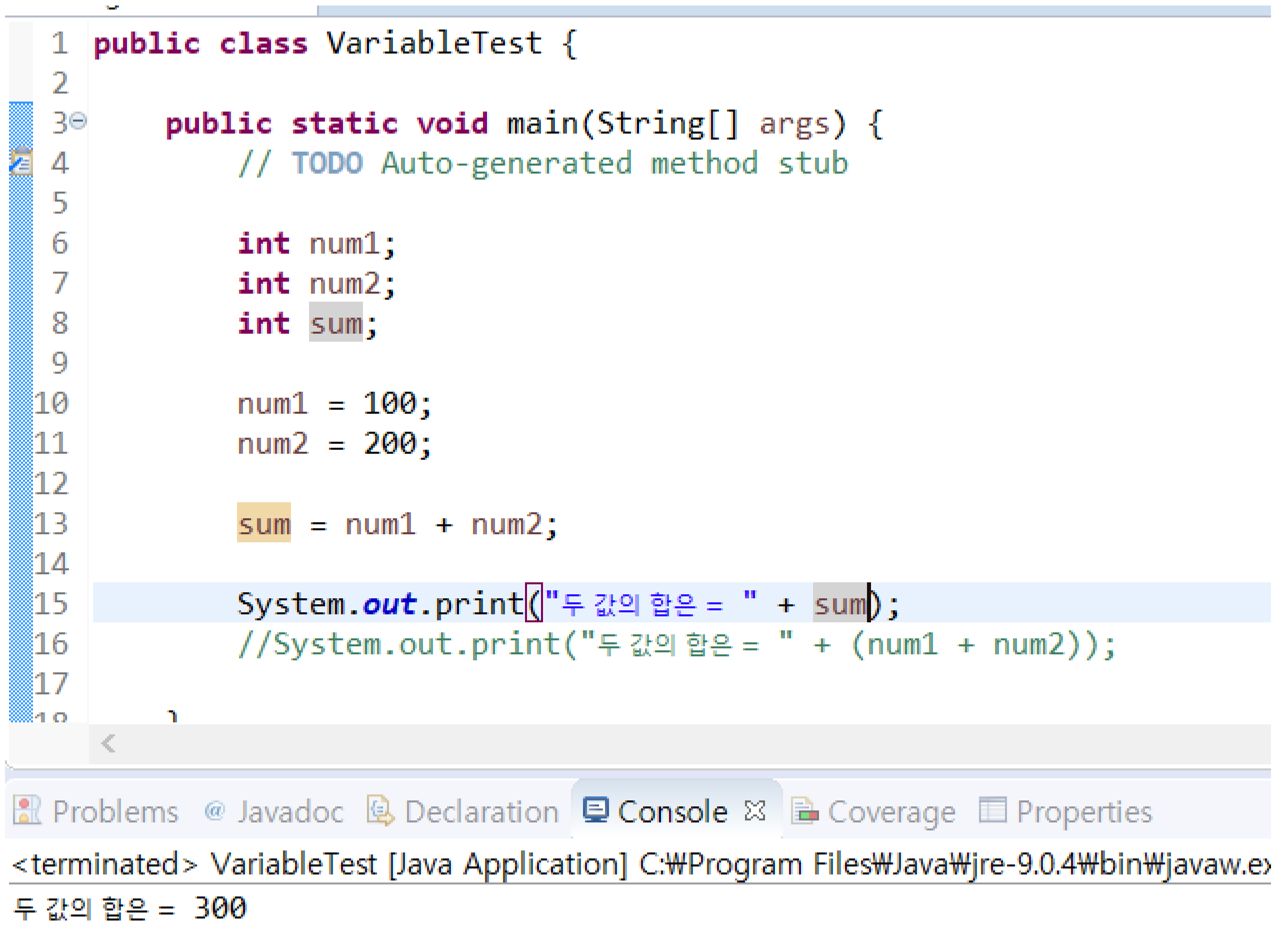


Java Logical Operators

Logical operators are used to determine the logic between variables or values:

Operator	Name	Description	Example	Try it
&&	Logical and	Returns true if both statements are true	x < 5 && x < 10	Try it »
||	Logical or	Returns true if one of the statements is true	x < 5 || x < 4	Try it »
!	Logical not	Reverse the result, returns false if the result is true	!(x < 5 && x < 10)	Try it »

Lab. Eclipse



```java
public class VariableTest {

    public static void main(String[] args) {
        // TODO Auto-generated method stub

        int num1;
        int num2;
        int sum;

        num1 = 100;
        num2 = 200;

        sum = num1 + num2;

        System.out.print("두 값의 합은 = " + sum);
        //System.out.print("두 값의 합은 = " + (num1 + num2));

    }
```

```
<terminated> VariableTest [Java Application] C:₩Program Files₩Java₩jre-9.0.4₩bin₩javaw.ex
두 값의 합은 = 300
```

Java Operators

Exercise:

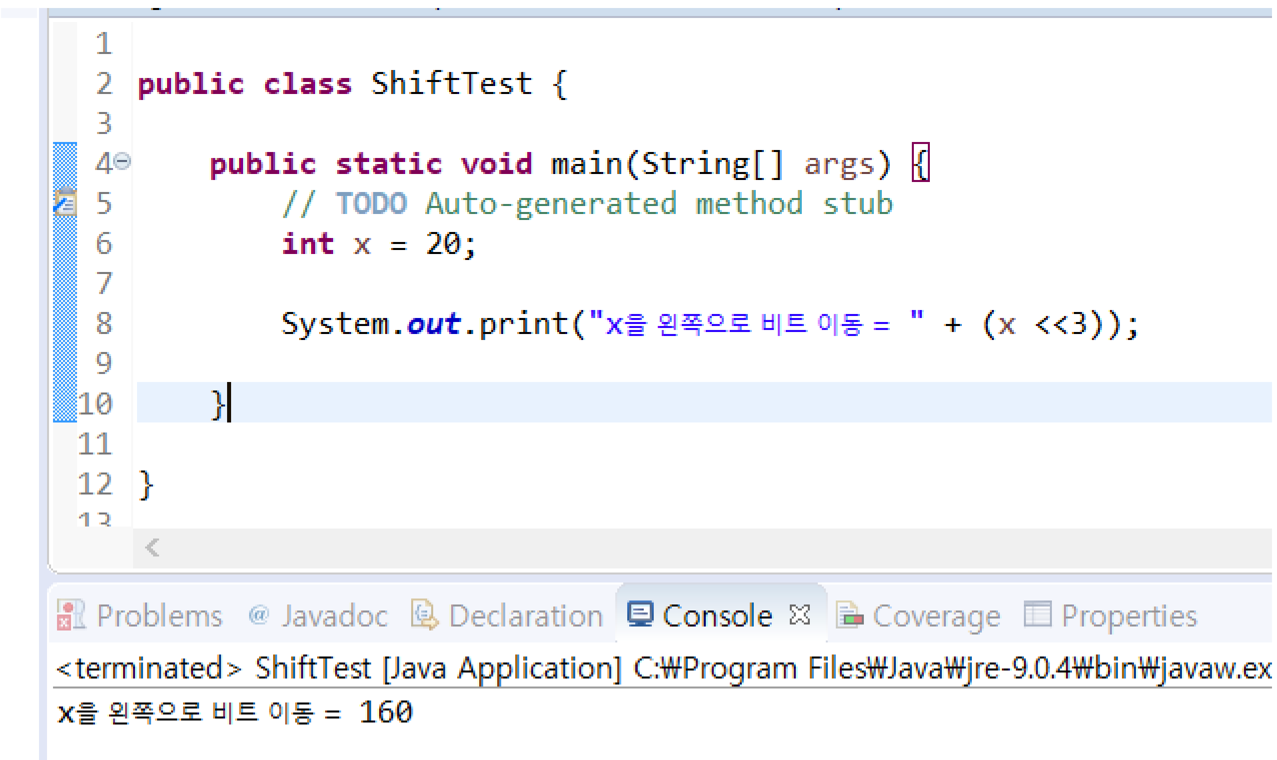
Multiply `10` with `5`, and print the result.

```
System.out.println(10 X 5);
```

Submit Answer »

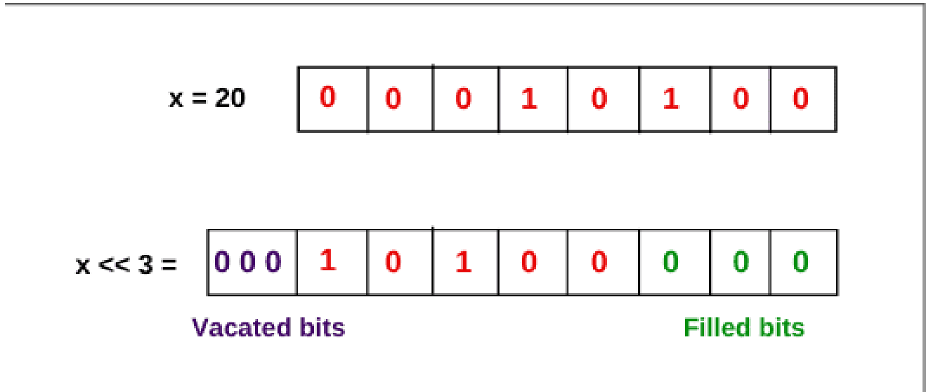
Start the Exercise

Lab. Eclipse



```java

public class ShiftTest {

    public static void main(String[] args) {
        // TODO Auto-generated method stub
        int x = 20;

        System.out.print("x을 왼쪽으로 비트 이동 = " + (x <<3));

    }

}
```

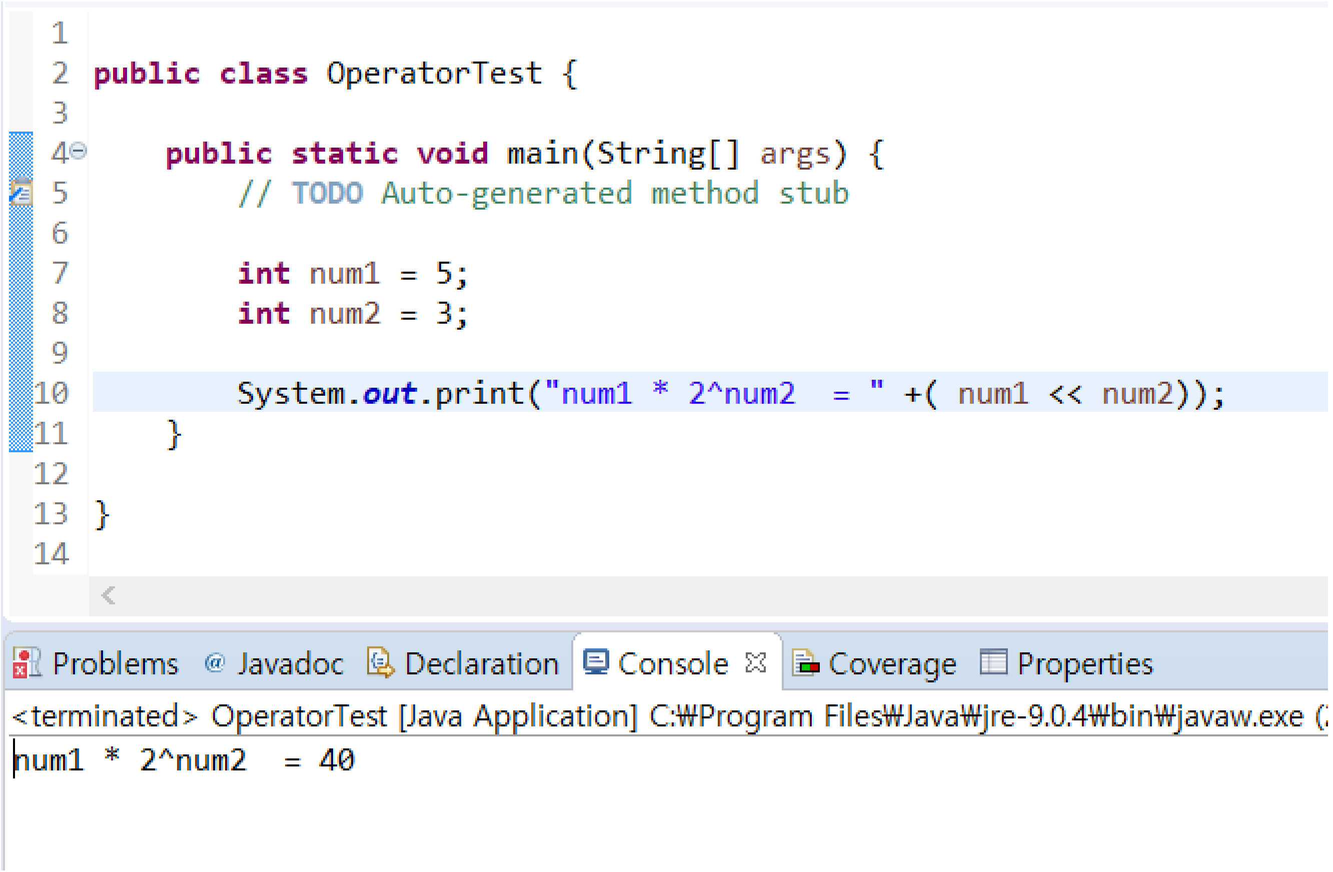
```
<terminated> ShiftTest [Java Application] C:₩Program Files₩Java₩jre-9.0.4₩bin₩javaw.ex
x을 왼쪽으로 비트 이동 = 160
```



x = 20	0	0	0	1	0	1	0	0
x << 3 =	0 0 0	1	0	1	0	0	0	0	0

Fig: Shifting bits towards left 3 times

Lab. Eclipse



```java

public class OperatorTest {

    public static void main(String[] args) {
        // TODO Auto-generated method stub

        int num1 = 5;
        int num2 = 3;

        System.out.print("num1 * 2^num2  = " +( num1 << num2));
    }

}

```

```
<terminated> OperatorTest [Java Application] C:₩Program Files₩Java₩jre-9.0.4₩bin₩javaw.exe (
num1 * 2^num2  = 40
```