The if Statement & Operators….

- Less than or equal to: `a <= b`
- Less than: `a < b`
- Greater than: `a > b`
- Greater than or equal to: `a >= b`
- Equal to `a == b`
- Not Equal to: `a != b`

You can use these conditions to perform different actions for different decisions.

Java has the following conditional statements:

- Use `if` to specify a block of code to be executed, if a specified condition is true
- Use `else` to specify a block of code to be executed, if the same condition is false
- Use `else if` to specify a new condition to test, if the first condition is false
- Use `switch` to specify many alternative blocks of code to be executed

The if Statement

Use the `if` statement to specify a block of Java code to be executed if a condition is `true`.

Syntax

```
if (condition) {
  // block of code to be executed if the condition is true
}
```

Note that `if` is in lowercase letters. Uppercase letters (If or IF) will generate an error.

In the example below, we test two values to find out if 20 is greater than 18. If the condition is `true`, print some text:

Example

```
if (20 > 18) {
  System.out.println("20 is greater than 18");
}
```

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We can also test variables:

Example

```
int x = 20;
int y = 18;
if (x > y) {
  System.out.println("x is greater than y");
}
```

Example explained

In the example above we use two variables, x and y, to test whether x is greater than y (using the `>` operator). As x is 20, and y is 18, and we know that 20 is greater than 18, we print to the screen that "x is greater than y".

The else Statement

Use the `else` statement to specify a block of code to be executed if the condition is `false`.

Syntax

```
if (condition) {
  // block of code to be executed if the condition is true
} else {
  // block of code to be executed if the condition is false
}
```

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Example

```
int time = 20;
if (time < 18) {
  System.out.println("Good day.");
} else {
  System.out.println("Good evening.");
}
// Outputs "Good evening."
```

Example explained

In the example above, time (20) is greater than 18, so the condition is `false`. Because of this, we move on to the `else` condition and print to the screen "Good evening". If the time was less than 18, the program would print "Good day".

The else if Statement

Use the else if statement to specify a new condition if the first condition is false.

Syntax

```
if (condition1) {
  // block of code to be executed if condition1 is true
} else if (condition2) {
  // block of code to be executed if the condition1 is false and
condition2 is true
} else {
  // block of code to be executed if the condition1 is false and
condition2 is false
}
```

Example

```
int time = 22;
if (time < 10) {
  System.out.println("Good morning.");
} else if (time < 20) {
  System.out.println("Good day.");
} else {
  System.out.println("Good evening.");
}
// Outputs "Good evening."
```

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Example explained

In the example above, time (22) is greater than 10, so the first condition is false. The next condition, in the else if statement, is also false, so we move on to the else condition since condition1 and condition2 is both false - and print to the screen "Good evening".

Java Booleans

Very often, in programming, you will need a data type that can only have one of two values, like:

- YES / NO
- ON / OFF
- TRUE / FALSE

For this, Java has a `boolean` data type, which can take the values `true` or `false`.

Boolean Values

A boolean type is declared with the `boolean` keyword and can only take the values `true` or `false`:

Example

```
boolean isJavaFun = true;
boolean isFishTasty = false;
System.out.println(isJavaFun);     // Outputs true
System.out.println(isFishTasty);   // Outputs false
```

However, it is more common to return boolean values from boolean expressions, for conditional testing (see below).

Boolean Expression

A Boolean expression is a Java expression that returns a Boolean value: `true` or `false`.

You can use a comparison operator, such as the greater than (`>`) operator to find out if an expression (or a variable) is true:

Example

```
int x = 10;
int y = 9;
System.out.println(x > y); // returns true, because 10 is higher than
9
```

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Or even easier:

Example

```
System.out.println(10 > 9); // returns true, because 10 is higher
than 9
```

In the examples below, we use the equal to (`==`) operator to evaluate an expression:

Example

```
int x = 10;
System.out.println(x == 10); // returns true, because the value of x
is equal to 10
```

Example

```
System.out.println(10 == 15); // returns false, because 10 is not
equal to 15
```

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