

Theory: Ternary operator

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The **ternary operator** is an operator which evaluates a condition and chooses one of two cases to execute. It is also called the **conditional operator**. The operator can be considered as a form of the `if`-then-`else` statement. The ternary operator should not be confused with the conditional statement, despite their ideological similarity. This operator can be used in places where an expression is expected.

Sometimes the **ternary operator** is more readable and concise than the corresponding **if statement**.

Let's start learning this operator with an example. Suppose we have to find the maximum of two int variables, `a` and `b`. It is easy to write using a conditional statement:

```
1 int a = ...;
2 int b = ...;
3 int max = ...;
4
5 if (a > b) {
6     max = a;
7 } else {
8     max = b;
9 }
```

The equal ternary operator looks like:

```
1 int max = a > b ? a : b;
```

This code is more concise than the code above, isn't it?

The general syntax of the ternary operator is the following:

```
1 result = condition ? trueCase : elseCase;
```

It includes two special symbols `?` and `:`.

Here, the `condition` is a Boolean expression that evaluates to either `true` or `false`. If this expression is `true`, the ternary operator evaluates `trueCase`, otherwise `elseCase` is evaluated. It is important that `trueCase` and `elseCase` are expressions which can be reduced to a common type. This type determines the type of the `result`.

Let's consider another example that prints whether a number is even or odd.

```
1 int num = ...; // it's initialized by a value
2 System.out.println(num % 2 == 0 ? "even" : "odd");
```

This ternary operator consists of three operands: the value of the expression `num % 2 == 0`, and two string literals `"even"` and `"odd"`. The result type of it is `String`.

Note, Java allows us to nest one ternary operator into another one, but it can be less readable than the corresponding conditional statement. If you do this, be careful.

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Topic depends on:

✓ Conditional statement Stage 2

Topic is required for:

✓ The for-loop Stage 2

✓ The while and do-while loops Stage 2

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