

Relational Operators

In this lesson, we will learn the basic relational operations in R and how to use them.

We'll cover the following

- What are Relational Operators?
- The %in% operator

What are Relational Operators?

Relational Operators are used for comparing objects. They return a boolean variable, i.e., `TRUE` or `FALSE`.

Operator	Example	Description
<code>==</code>	<code>a == b</code>	Equal to
<code>!=</code>	<code>a != b</code>	Not equal to
<code><</code>	<code>a < b</code>	Less than
<code><=</code>	<code>a <= b</code>	Less than equal to
<code>></code>	<code>a > b</code>	Greater than
<code>>=</code>	<code>a >= b</code>	Greater than equal to

Let's have a look at the code:

```
number1 <- 10  
number2 <- 3
```



```
number2 <- 5

# Equal to
number1 == number2

# Not equal to
number1 != number2

# Less than
number1 < number2

# Less than equal to
number1 <= number2

# Greater than
number1 > number2

# Greater than equal to
number1 >= number2
```



Relational operators on numbers

If you use a relational operator to compare vectors, R will do element-wise comparisons.

The output of performing relational operations on two vectors is a vector!

```
vector1 <- c(5, 10, 15)
vector2 <- c(3, 6, 9)

# Equal to
vector1 == vector2

# Not equal to
vector1 != vector2

# Less than
vector1 < vector2

# Less than equal to
vector1 <= vector2

# Greater than
vector1 > vector2

# Greater than equal to
vector1 >= vector2
```





Relational operators on vectors

The `%in%` operator





The `%in%` operator is used only **on vectors** and it is the only operator that does not do normal element-wise execution.

`%in%` checks whether the value(s) on the left side are present on the right side. This means `%in%` tests whether each value on the left is somewhere in the vector on the right:

 TRUE
  FALSE

```
myVector <- c(5, 3, 15)
number <- 3

number %in% myVector
```





Check whether the number is in the vector

When using relational operators to compare vectors, if the two vectors are of unequal length, R tries to equalize them by replicating the smaller one.

If the vector on the left-hand side has multiple elements, each element is searched in the vector on the right-hand side. Individual `TRUE` or `FALSE` values are produced as a result.

```
vector1 <- c(5, 3, 15)
vector2 <- c(3, 10)

vector2 %in% vector1 # 3 is present in vector1 but 10 is not present in vector2
```

Check whether elements of the second vector are present in the first vector.

We will be using these relational operators in more detail in the next chapter on [Conditional Statements](#).

For now, we will be moving on to Logical Operators.

