The if Statement

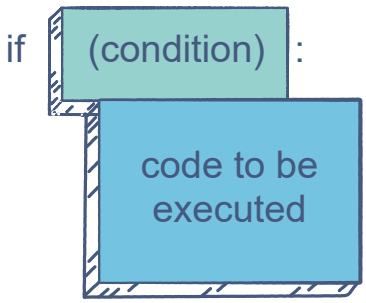
This lesson showcases the functionality of the 'if' statement.

We'll cover the following

The Structure

The simplest conditional statement that we can write is the `if` statement. It comprises of two parts:

1. The **condition**
2. The **code to be executed**



The `:` in the illustration above is necessary to specify the beginning of the `if` statement's code to be executed. However, the parentheses, `()`, around the condition are optional. The code to be executed is indented at least one tab to the right.

An `if` statement runs like this:

> **if** the **condition** holds `True`, execute the **code to be executed**. Otherwise, **skip** it and move on.

Let's write a simple `if` statement that verifies the value of an integer:

```
num = 5

if (num == 5):  # The condition is true
    print("The number is equal to 5")  # The code is executed

if num > 5:  # The condtion is false
    print("The number is greater than 5")  # The code is not executed
```

Our first condition simply checks whether the value of `num` is `5`. Since this Boolean expression returns `True`, the compiler goes ahead and executes the `print` statement on **line 4**.

As we can see, the `print` command inside the body of the `if` statement is indented to the right. If it wasn't, there would be an error. Python puts a lot of emphasis on proper indentation.

Conditions with Logical Operators

We can use logical operators to create more complex conditions in the `if` statement. For example, we may want to satisfy multiple clauses for the expression to be `True`.

```
num = 12

if num % 2 == 0 and num % 3 == 0 and num % 4 == 0:
    # Only works when num is a multiple of 2, 3, and 4
    print("The number is a multiple of 2, 3, and 4")

if (num % 5 == 0 or num % 6 == 0):
    # Only works when num is either a multiple of 5 or 6
    print("The number is a multiple of 5 and/or 6")
```

In the first `if` statement, all the conditions have to be fulfilled since we're using the `and` operator.

In the second `if` statement, the Boolean expression would be true if either of the clauses are satisfied because we are using the `or` operator.

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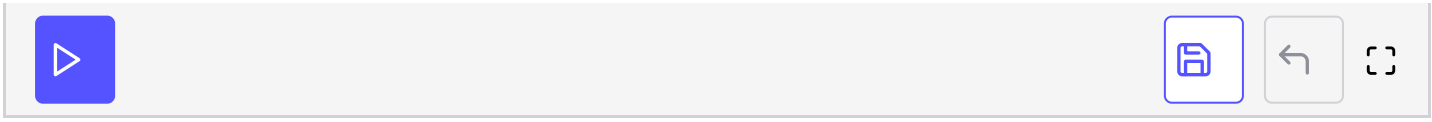
Nested `if` Statements

A cool feature of conditional statements is that we can nest them. This means that there could be an `if` statement inside another!

Hence, we can use nesting to make complex conditions in our program:

```
num = 63

if num >= 0 and num <= 100:
    if num >= 50 and num <= 75:
        if num >= 60 and num <= 70:
            print("The number is in the 60-70 range")
```



> **Note**: Each nest `if` statement requires further indentation.

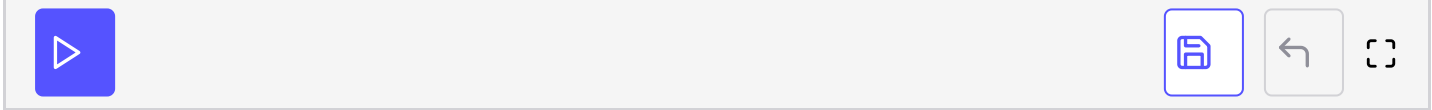
Creating and Editing Values

In a conditional statement, we can edit the values of our variables.

Furthermore, we can create new variables.

```
num = 10
if num > 5:
    num = 20  # Assigning a new value to num
    new_num = num * 5  # Creating a new value called newNum

# The if condition ends, but the changes made inside it remain
print(num)
print(new_num)
```



The `if` statement is the foundation of conditional programming in Python. The next two types of conditional statements we'll learn are simply extensions of `if`.

In the next lesson, we'll cover the `if-else` statement.