

p



# PYTHON

BASIC syntax

## Python Data type:

```
# Integer
num = 42
print(num)
```

42

```
# Float
float_num = 3.14
print(float_num)
```

3.14

```
# String
text = "Hello, World!"
print(text)
```

Hello, World!

```
# Boolean
is_true = True
print(is_true)
```

True

```
# List
my_list = [1, 2, 3]
print(my_list)
```

[1, 2, 3]

```
# Tuple
my_tuple = (1, 2, 3)
print(my_tuple)
```

(1, 2, 3)

```
# Set
my_set = {1, 2, 3}
print(my_set)
```

{1, 2, 3}

```
# Dictionary
my_dict = {"key": "value", "num": 42}
print(my_dict)
```

{'key': 'value', 'num': 42}

```
# NoneType
none_var = None
print(none_var)
```

None

```
# Complex
complex_var = 3 + 4j
print(complex_var)
```

(3+4j)

```
# Bytes
byte_data = b'hello'
```

b'hello'

<pre>print(byte_data)</pre>	
<pre># Bytearray bytearray_data = bytearray([65, 66, 67]) print(bytearray_data)</pre>	<pre>bytearray(b'ABC')</pre>
<pre># Range range_var = range(5) print(list(range_var))</pre>	<pre>[0, 1, 2, 3, 4]</pre>
<pre># FrozenSet frozen_set = frozenset({1, 2, 3}) print(frozen_set)</pre>	<pre>frozenset({1, 2, 3})</pre>
<pre># Bytes (with Unicode) unicode_bytes = b'hello'.decode('utf-8') print(unicode_bytes)</pre>	<pre>hello</pre>

<b>Python operator:</b>	
<pre># Addition result_addition = 10 + 5 print(result_addition)</pre>	<pre>15</pre>
<pre># Subtraction result_subtraction = 10 - 5 print(result_subtraction)</pre>	<pre>5</pre>
<pre># Multiplication result_multiplication = 10 * 5 print(result_multiplication)</pre>	<pre>50</pre>
<pre># Division result_division = 10 / 5 print(result_division)</pre>	<pre>2.0</pre>
<pre># Modulus (Remainder) result_modulus = 10 % 3 print(result_modulus)</pre>	<pre>1</pre>
<pre># Equal to result_equal = (10 == 5) print(result_equal)</pre>	<pre>False</pre>

<pre># Not equal to result_not_equal = (10 != 5) print(result_not_equal)</pre>	True
<pre># Greater than result_greater_than = (10 &gt; 5) print(result_greater_than)</pre>	True
<pre># Less than result_less_than = (10 &lt; 5) print(result_less_than)</pre>	False
<pre># Greater than or equal to result_greater_equal = (10 &gt;= 5) print(result_greater_equal)</pre>	True
<pre># Less than or equal to result_less_equal = (10 &lt;= 5) print(result_less_equal)</pre>	False
<pre># Logical AND result_logical_and = True and False print(result_logical_and)</pre>	False
<pre># Logical OR result_logical_or = True or False print(result_logical_or)</pre>	True
<pre># Logical NOT result_logical_not = not True print(result_logical_not)</pre>	False

## Python conditional Statements:

<pre># If statement x = 10 if x &gt; 5:     print("x is greater than 5")</pre>	x is greater than 5
--	---------------------

# If-else statement y = 3 if y % 2 == 0: print("y is even")	else: print("y is odd")	y is odd
# If-elif-else statement z = 15 if z > 10: print("z is greater than 10") elif z == 10: print("z is equal to 10") else: print("z is less than 10")		z is greater than 10

Python loop statements:		
# For loop with a list fruits = ["apple", "banana", "cherry"] for fruit in fruits: print(fruit)		apple banana cherry
# For loop for j in range(3): print(j)		0 1 2
# While loop i = 0 while i < 5: print(i) i += 1		0 1 2 3 4

Python input/output:		
# Input from the user user_input = input("Enter a number: ") print("You entered:", user_input)		42

<pre># Taking multiple inputs from the user name = input("Enter your name: ") age = input("Enter your age: ") print(f"Hello, {name}! You are {age} years old.")</pre>	<pre>Enter your name:Alice Enter your age: 25 Hello, Alice! You are 25 years old.</pre>
<pre># Printing output print("Hello, World!")</pre>	<pre># Output: Hello, World!</pre>
<pre># Formatted Output name = "Alice" age = 30 print(f"My name is {name} and I am {age} years old.")</pre>	<pre>My name is Alice and I am 30 years old.</pre>

<b>Python strings:</b>	
<pre># Slicing message = "Hello, World!" print(message[7:])</pre>	<pre>World!</pre>
<pre># Length of a String text = "Hello, World!" length = len(text) print(length)</pre>	<pre>13</pre>
<pre># Lowercase text = "Hello, World!" lower_text = text.lower() print(lower_text)</pre>	<pre>hello, world!</pre>
<pre># Uppercase text = "Hello, World!" upper_text = text.upper() print(upper_text)</pre>	<pre>HELLO, WORLD!</pre>
<pre># Capitalize text = "hello, world!" capitalized_text = text.capitalize()</pre>	<pre>Hello, world!</pre>

<pre>print(capitalized_text)</pre>	
<pre># Find text = "Hello, World!" index_world = text.find("World") print(index_world) # Replace text = "Hello, World!" new_text = text.replace("World", "Universe") print(new_text)</pre>	<pre>7</pre> <pre>Hello, Universe!</pre>
<pre># Strip text = "  Hello, World!  " stripped_text = text.strip() print(stripped_text)</pre>	<pre>Hello, World!</pre>
<pre># Split text = "apple,orange,banana" fruits_list = text.split(",") print(fruits_list)</pre>	<pre>['apple', 'orange', 'banana']</pre>
<pre># Startswith text = "Hello, World!" starts_with_hello = text.startswith("Hello") print(starts_with_hello)</pre>	<pre>True</pre>
<pre># Endswith text = "Hello, World!" ends_with_world = text.endswith("World!") print(ends_with_world)</pre>	<pre>True</pre>
<pre># isalpha text = "Hello" is_alpha = text.isalpha() print(is_alpha)</pre>	<pre>True</pre>
<pre># isdigit number = "123" is_digit = number.isdigit() print(is_digit)</pre>	<pre>True</pre>

<pre># isspace whitespace = "   " is_space = whitespace.isspace() print(is_space)</pre>	<pre>True</pre>
<pre># Join fruits = ["apple", "orange", "banana"] joined_fruits = ", ".join(fruits) print(joined_fruits)</pre>	<pre>apple, orange, banana</pre>
<pre># Center text = "Hello" centered_text = text.center(10, "*") print(centered_text)</pre>	<pre>**Hello**</pre>
<pre># Left Strip and Right Strip text = "   Hello, World!   " left_stripped_text = text.lstrip() right_stripped_text = text.rstrip() print(left_stripped_text) print(right_stripped_text)</pre>	<pre>Hello, World! Hello, World!</pre>
<pre># Swapcase text = "Hello, World!" swapped_case_text = text.swapcase() print(swapped_case_text)</pre>	<pre>hELLO, wORLD!</pre>
<pre># Format name = "Alice" age = 30 formatted_text = "My name is {} and I am {} years old.".format(name, age) print(formatted_text)</pre>	<pre>My name is Alice and I am 30 years old.</pre>
<pre># Sorting text = "programming" sorted_chars = sorted(text) print(sorted_chars)</pre>	<pre>['a', 'g', 'g', 'i', 'm', 'm', 'n', 'o', 'p', 'r']</pre>



<pre># Min and Max text = "programming" min_char = min(text) max_char = max(text) print(min_char) print(max_char)</pre>	<pre>a r</pre>
<pre># In text = "PythonProgramming" contains_python = "Python" in text print(contains_python)</pre>	<pre>True</pre>

## Python math method/function:=import math

<pre># Square Root num_sqrt = math.sqrt(25) print("Square Root of 25:", num_sqrt)</pre>	<pre>Square Root of 25: 5.0</pre>
<pre># Power num_power = math.pow(2, 3) print("2 raised to the power of 3:", num_power)</pre>	<pre>2 raised to the power of 3: 8.0</pre>
<pre># Absolute Value absolute_value = math.fabs(-10.5) print("Absolute Value of -10.5:", absolute_value)</pre>	<pre>Absolute Value of -10.5: 10.5</pre>
<pre># Ceil (smallest integer greater than or equal to x) ceil_value = math.ceil(4.2) print("Ceil of 4.2:", ceil_value)</pre>	<pre>Ceil of 4.2: 5</pre>
<pre># Floor (largest integer less than or equal to x) floor_value = math.floor(4.8) print("Floor of 4.8:", floor_value)</pre>	<pre>Floor of 4.8: 4</pre>
<pre># Trigonometric Functions (in radians) sin_value = math.sin(math.radians(30)) print("Sin of 30 degrees:", sin_value)</pre>	<pre>Sin of 30 degrees: 0.49999999999999994</pre>

<pre>cos_value = math.cos(math.radians(45)) print("Cos of 45 degrees:", cos_value)  tan_value = math.tan(math.radians(60)) print("Tan of 60 degrees:", tan_value)</pre>	<pre>Cos of 45 degrees: 0.7071067811865475 Tan of 60 degrees: 1.7320508075688772</pre>
<pre># Logarithmic Functions log_value = math.log(100, 10) print("Log base 10 of 100:", log_value)</pre>	<pre>Log base 10 of 100: 2.0</pre>
<pre># Constants print("Value of pi:", math.pi) print("Value of e (Euler's number):", math.e)</pre>	<pre>Value of pi: 3.141592653589793 Value of e (Euler's number): 2.718281828459045</pre>