Python Programming

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Numbers

Learning outcomes:

Numbers in Python
Number Type Conversion
Mathematical Functions
Trigonometric Functions
Mathematical Constants

Numbers

Number data types store numeric values. They are immutable data types, means that changing the value of a number data type results in a newly allocated object.
Number objects are created when you assign a value to them.

Numbers

Python supports different numerical types:

int (signed integers): They are often called just integers or ints, are positive or negative whole numbers with no decimal point.

float (floating point real values) : Also called floats, they represent real numbers and are written with a decimal point dividing the integer and fractional parts. Floats may also be in scientific notation, with E or e indicating the power of 10 (2.5e2 = 2.5 * 10**2 = 250).

Numbers

complex (complex numbers) : are of the form a + bJ, where **a** and **b** are floats and J (or j) represents the square root of **-1** (which is an **imaginary number**). The real part of the number is **a**, and the imaginary part is **b**. Complex numbers are not used much in Python programming.

Number Type Conversion

Python converts numbers internally in an expression containing mixed types to a common type for evaluation. But sometimes, you need to coerce a number explicitly from one type to another to satisfy the requirements of an operator or function parameter.

Type **int(x)** to convert x to a plain integer.

Type **float(x)** to convert x to a floating-point number.

Number Type Conversion

Type **complex(x)** to convert x to a complex number with real part x and imaginary part zero.

Type **complex(x, y)** to convert x and y to a complex number with real part x and imaginary part y. x and y are numeric expressions

Mathematical Functions

Python provides different functions that perform mathematical calculations.

abs(x) : The absolute value of x: the (positive) distance between x and zero.

ceil(x) : The ceiling of x: the smallest integer not less than x

cmp(x, y) : -1 if x < y, 0 if x == y, or 1 if x > y

exp(x) :The exponential of x:

log(x) :The natural logarithm of x, for x> 0

log10(x) : The base-10 logarithm of x for x> 0.

Mathematical Functions

max(x1, x2,...) : The largest of its arguments: the value closest to positive infinity

min(x1, x2,...) : The smallest of its arguments: the value closest to negative infinity

pow(x, y) : The value of x**y.

sqrt(x) : The square root of x for x > 0

Trigonometric Functions

Python provides different functions that perform trigonometric calculations.

acos(x) : Return the arc cosine of x, in radians.
cos(x) : Return the cosine of x radians.
degrees(x): Converts angle x from radians to degrees.
radians(x) : Converts angle x from degrees to radians.

MANY MORE.

Mathematical Constants

The module also defines two mathematical constants:

Constants	Description
pi	The mathematical constant pi.
e	The mathematical constant e.