

# What is NumPy?

This lesson gives a brief introduction to what is NumPy and explains data types in NumPy.

## WE'LL COVER THE FOLLOWING ^

- Data type

**NumPy** is a *library for the Python programming language*, adding support for large, multi-dimensional arrays and matrices, along with a large collection of high-level mathematical functions to operate on these arrays.

## Data type #

Type	Name	Bytes	Description
bool	b	1	Boolean (True or False) stored as a byte
int	l	4-8	Platform (long) integer (normally either int32 or int64)
intp	p	4-8	Integer used for indexing (normally either int32 or int64)

	int8	i1	1	Byte (-128 to 127)
	int16	i2	2	Integer (-32768 to 32767)
	int32	i4	4	Integer (-2147483648 to 2147483647)
	int64	i8	8	Integer (-9223372036854775808 to 9223372036854775807)
	uint8	u1	1	Unsigned integer (0 to 255)
	uint16	u2	2	Unsigned integer (0 to 65535)
	uint32	u4	4	Unsigned integer (0 to 4294967295)
	uint64	u8	8	Unsigned integer (0 to 18446744073709551615)
	float	f8	8	Shorthand for float64

<code>float16</code>	<code>f2</code>	2	Half precision float: sign bit, 5 bits exponent, 10 bits mantissa
<code>float32</code>	<code>f</code>	4	Single precision float: sign bit, 8 bits exponent, 23 bits mantissa
<code>float64</code>	<code>d</code>	8	Double precision float: sign bit, 11 bits exponent, 52 bits mantissa
<code>complex</code>	<code>c16</code>	16	Shorthand for <code>complex128</code> .
<code>complex64</code>	<code>c8</code>	8	Complex number, represented by two 32-bit floats
<code>complex128</code>	<code>c16</code>	16	Complex number, represented by two 64-bit floats

NumPy knows that `int` refers to `np.int_`, `bool` means `np.bool_`, that `float` is `np.float_` and `complex` is `np.complex_`. The other data-types do not have Python equivalents.

Additionally, the names such as `intc`, `long`, or `double` used in the C programming language are defined.

Now that the concept of data types is clear, let's move on to the next lesson "Creation in NumPy".