

# Data Types

## Available Data Types

Odysseus provides a wide range of data types for your processing.

### Numeric Types

#### Double

A double-precision 64-bit IEEE 754 floating point.

#### Float

A single-precision 32-bit IEEE 754 floating point.

#### Long

An 64-bit signed two's complement integer. Permissible values are -9,223,372,036,854,775,808 to 9,223,372,036,854,775,807 (inclusive).

#### Integer

An 32-bit signed two's complement integer. Permissible values are -2,147,483,648 to 2,147,483,647 (inclusive).

#### Short

An 16-bit signed two's complement integer. Permissible values are -32,768 to 32,767 (inclusive).

#### Byte

An 8-bit signed two's complement integer. Permissible values are -128 to 127 (inclusive).

#### Char

A single 16-bit Unicode character. Permissible values are '\u0000' (or 0) to '\uffff' (or 65,535 inclusive).

#### Boolean

A `boolean` with the two possible values: `true` and `false`.

### String Types

#### String

A sequence of characters. A string can contain up to  $2^{31}$  Unicode characters.

### Date and Time Types

#### Date

#### Timestamp

### Complex Types

#### Matrix

An  $n \times m$  matrix consisting of double-precision 64-bit IEEE 754 floating point numbers.

#### Vector

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A vector consisting of double-precision 64-bit IEEE 754 floating point numbers.

## List

A list of objects.

The type of objects in the list has to be defined in the schema definition `[[timestamp.unixtimestamp', 'List (Integer)']]` and can be accessed in expressions: `'timestamp.unixtimestamp[0] = 1162304033'`

## Optional Data Types

The following data types are not part of the Odysseus Core and may be restricted.

### Spatial Data Types (Spatial Feature)

The spatial data types are based on the "[Well-known text](#)" (WKA) format.

#### SpatialGeometry

A spatial geometry

#### SpatialGeometryCollection

A spatial geometry collection

#### SpatialCoordinate

A spatial coordinate with attributes **x**, **y**, and **z**.

#### SpatialCoordinateSequence

A spatial coordinate sequence

#### SpatialPolarCoordinate

A spatial polar coordinate with attributes **r**, and **a**

#### SpatialPoint

A spatial point with attributes **coordinate** and **srid**.

An example for a data input in this format could be:

```
POINT(7.129585 53.648660);SRID=4326
```

or just

```
POINT(7.129585 53.648660)
```

#### SpatialMultiPoint

A spatial multi point.

#### SpatialLineString

A spatial line string with attributes **points** and **srid**.

#### SpatialMultiLineString

A spatial multi line string

#### SpatialLinearRing

A spatial linear ring

#### SpatialLinearRingArray

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A spatial linear ring array

## **SpatialPolygon**

A spatial polygon with attributes **shell**, **holes**, and **srid**

## **SpatialMultiPolygon**

A spatial multi polygon

## Interval Data Types (Interval Feature)

### **IntervalDouble**

An interval with **inf** and **sup**

## Image Data Types (Image Feature)

### **Image**

An image with **buffer**, **width**, and **height**

## ImageJCV Data Types (ImageJCV Feature)

### **ImageJCV**

An image represented by an [IplImage](#) from the [OpenCV](#) library. Supports multiple [pixel formats](#), [image depths](#) and channel numbers. [Here](#) is a list of manipulation functions for the ImageJCV data type.

## Probabilistic Data Types (Probabilistic Feature)

### **ProbabilisticDouble**

A continuous or discrete random variable described by a mixture model

## Graph Data Types (Graph Server Feature)

### **Graph**

A graph object from the [org.graphstream.gs-core](#) library.

### **GraphNode**

A node object from the [org.graphstream.gs-core](#) library.

### **List\_GraphNode**

A list of node objects from the [org.graphstream.gs-core](#) library.

### **GraphEdge**

An edge object from the [org.graphstream.gs-core](#) library.

### **List\_GraphEdge**

A list of edge objects from the [org.graphstream.gs-core](#) library.