

Python

numpy => np
 pandas => pd
 scipy.sparse => sc
 gstlearn => gl



Get a Python type of variable named 'myvar':
`type(myvar)`

Basic types

	Python		C++		Python
Characters string	str		std::string (aka String)		str
Integer value	int np.intc np.int64 etc...		int		int
Real value	float np.double np.float64 etc...		double		float
Boolean value	bool np.bool_ etc...		bool		bool

Vectors

Array of real values	tuple list of reals np.ndarray		std::vector<double> (aka VectorDouble)		np.ndarray of np.float64
Array of integer values	tuple list of integers np.ndarray		std::vector<int> (aka VectorInt)		np.ndarray of np.int64
Array of characters string	tuple list of characters string np.ndarray		std::vector<String> (aka VectorString)		tuple of characters string

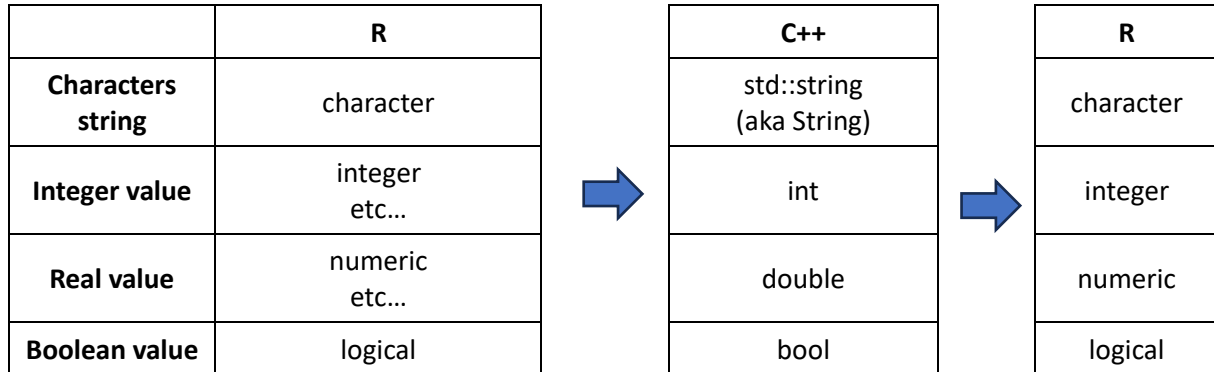
Arrays of vectors (2D arrays)

Array of Arrays of real values	list of tuples, lists or np.array np.arrays of reals		std::vector<std::vector<double>> (aka VectorVectorDouble)		2D np.array of np.float64
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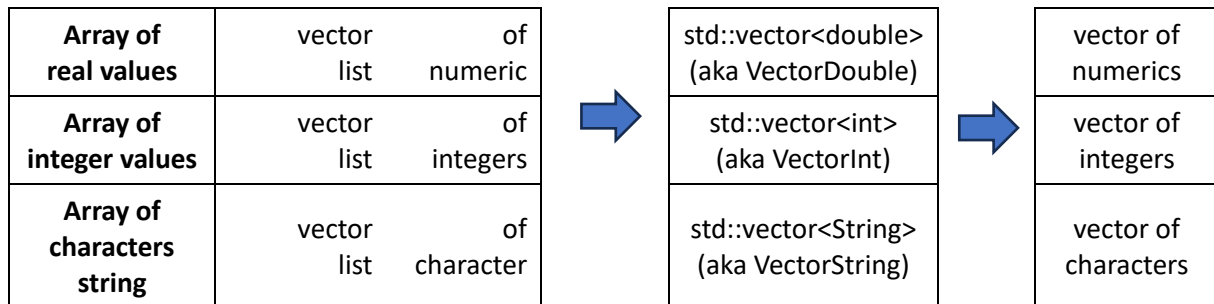


Get a R type of variable named 'myvar':
`class(myvar)`

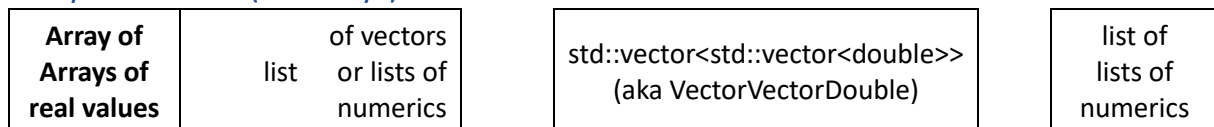
Basic types



Vectors



Arrays of vectors (2D arrays)



Other considerations

Non available value (NaN or NA)

gstlearn uses macros for NA values that are automatically converted from/into the target language as follow:

C++	Python	R
#define TEST 1.234e30	np.NaN	NA
#define ITEST -1234567	gl.inan	NA

toTL function

(convert **gstlearn** object to Target Language)

	C++ class	Python type	R type (package)
Database	Db	pd.DataFrame	data.frame
Matrix (sparse)	MatrixSparse	sc.csc_matrix	matrix
Matrix (dense)	Matrix*	np.ndarray	sparseMatrix (Matrix)
List of triplets (i,j,v)	Triplet	sc.csc_matrix	sparseMatrix (Matrix)
Table (excel sheet)	Table	np.ndarray	matrix

Enumerations:

- Used for categorical values
- **enum** C++ keyword is not used
- All "Enum" classes start with 'E' and inherits from **AEnum**
- Each category is a static (unique) object own by the class
- A category is represented by
 - o an integer value: method `getValue()`
 - o an key (short characters string): method `getKey()`
 - o a description (long character string): method `getDesc()`

Example with `EStatOption`:

Single category

	C++ class	Python	R
MEAN operator	<code>EStatOption::MEAN</code>	<code>gl.EStatOption.MEAN</code>	<code>EStatOption_MEAN()</code>
STDV operator	<code>EStatOption::STDV</code>	<code>gl.EStatOption.STDV</code>	<code>EStatOption_STDV()</code>

etc...

Vector of categories

When **gstlearn** waits for a vector of "Enum" objects (see `dbStatisticsMono` function for example), the user must use the **fromKeys** static method:

Python: `opers=EStaticOption.fromKeys("MEAN", "MINI", "MAXI")`
`opers=[gl.EStatOption.MEAN, gl.EStatOption. MINI, gl.EStatOption. MAXI]`

R: `opers=EStaticOption_fromKeys("MEAN", "MINI", "MAXI")`