Cheat sheet: Numpy arrays

Creating numpy arrays

```
np.array([1, 2, 3], dtype=float)
np.array([[1.0, 2.0], [3.0 ,4.0]])
np.array(otherarray)        (→ copy)
np.empty((3, 3), dtype=float)
np.zeros(…), np.ones(…)
```

.rank	number of indices (axes)
.size	number of all elements
.shape	shape of the array

Accessing elements *arr*[*i1*, *i2*, …]

Array slices

at least one index is a range

arr[1, 2:3], *arr*[1, :]

array slices ≡ **array views** (mutable!)

Elementwise array operators

+, -, *, /, **, <, >, <=, >=, !=

ufuncs (np.sin, np.sqrt, ..)

Matrix multiplication

A @ *B*, np.**matrixmultiply**(*A*, *B*)

Reduction

np.**sum(…, axis=…)**, np.**product(…, axis=…)**

Broadcasting

Array repeated along missing axes

Axes inserted **before** existing ones

np.**newaxis**	Inserting axis at arbitrary position

Iteration over arrays

Behaves like iteration over nested lists