

## NumPy Basics

Operator	Description
<code>np.array([1,2,3])</code>	1d array
<code>np.array([(1,2,3),(4,5,6)])</code>	2d array
<code>np.arange(start,stop,step)</code>	range array

## Placeholders

Operator	Description
<code>np.linspace(0,2,9)</code>	Add evenly spaced values btw interval to array of length
<code>np.zeros((1,2))</code>	Create an array filled with zeros
<code>np.ones((1,2))</code>	Creates an array filled with ones
<code>np.random.random((5,5))</code>	Creates random array
<code>np.empty((2,2))</code>	Creates an empty array

## Array

Syntax	Description
array.shape	Dimensions (Rows,Columns)
len(array)	Length of Array
array.ndim	Number of Array Dimensions
array.dtype	Data Type
array.astype(type)	Converts to Data Type
type(array)	Type of Array

## Copying/Sorting

Operators	Description
np.copy(array)	Creates copy of array
other = array.copy()	Creates deep copy of array
array.sort()	Sorts an array
array.sort(axis=0)	Sorts axis of array

## Array Manipulation

### Adding or Removing Elements

Operator	Description
np.append(a,b)	Append items to array
np.insert(array, 1, 2, axis)	Insert items into array at axis 0 or 1
np.resize((2,4))	Resize array to shape(2,4)
np.delete(array,1,axis)	Deletes items from array

## Combining Arrays

Operator	Description
<code>np.concatenate((a,b),axis=0)</code>	Concatenates 2 arrays, adds to end
<code>np.vstack((a,b))</code>	Stack array row-wise
<code>np.hstack((a,b))</code>	Stack array column wise

## Splitting Arrays

Operator	Description
<code>numpy.split()</code>	Split an array into multiple sub-arrays.
<code>np.array_split(array, 3)</code>	Split an array in sub-arrays of (nearly) identical size
<code>numpy.hsplit(array, 3)</code>	Split the array horizontally at 3rd index

## More

Operator	Description
<code>other = ndarray.flatten()</code>	Flattens a 2d array to 1d
<code>array = np.transpose(other)</code> <code>array.T</code>	Transpose array
<code>inverse = np.linalg.inv(matrix)</code>	Inverse of a given matrix

## Mathematics

### Operations

Operator	Description
<code>np.add(x,y)</code> $x + y$	Addition
<code>np.subtract(x,y)</code> $x - y$	Subtraction
<code>np.divide(x,y)</code> $x / y$	Division
<code>np.multiply(x,y)</code> $x @ y$	Multiplication
<code>np.sqrt(x)</code>	Square Root
<code>np.sin(x)</code>	Element-wise sine
<code>np.cos(x)</code>	Element-wise cosine
<code>np.log(x)</code>	Element-wise natural log
<code>np.dot(x,y)</code>	Dot product
<code>np.roots([1,0,-4])</code>	Roots of a given polynomial coefficients

### Comparison

Operator	Description
==	Equal
!=	Not equal
<	Smaller than
>	Greater than
<=	Smaller than or equal
>=	Greater than or equal
np.array_equal(x,y)	Array-wise comparison

## Basic Statistics

Operator	Description
np.mean(array)	Mean
np.median(array)	Median
array.corrcoef()	Correlation Coefficient
np.std(array)	Standard Deviation

## More

Operator	Description
array.sum()	Array-wise sum
array.min()	Array-wise minimum value
array.max(axis=0)	Maximum value of specified axis
array.cumsum(axis=0)	Cumulative sum of specified axis

## Slicing and Subsetting

Operator	Description
array[i]	1d array at index i
array[i,j]	2d array at index[i][j]
array[i<4]	Boolean Indexing, see Tricks
array[0:3]	Select items of index 0, 1 and 2
array[0:2,1]	Select items of rows 0 and 1 at column 1
array[:1]	Select items of row 0 (equals array[0:1, :])
array[1:2, :]	Select items of row 1
[comment]: <> (	array[1,...]
array[ : :-1]	Reverses array