NumPy Basics

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

Placeholders

Operator	Description
np.linspace(0,2,9)	Add evenly spaced values btw interval to array of length
np.zeros((1,2))	Create and array filled with zeros
np.ones((1,2))	Creates an array filled with ones
np.random.random((5,5))	Creates random array
np.empty((2,2))	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
np.concatenate((a,b),axis=0)	Concatenates 2 arrays, adds to end
np.vstack((a,b))	Stack array row-wise
np.hstack((a,b))	Stack array column wise

Splitting Arrays

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

More

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

Mathematics

Operations

Operator	Description
np.add(x,y) x + y	Addition
np.substract(x,y) x - y	Subtraction
np.divide(x,y) x / y	Division
np.multiply(x,y) x @ y	Multiplication
np.sqrt(x)	Square Root
np.sin(x)	Element-wise sine
np.cos(x)	Element-wise cosine
np.log(x)	Element-wise natural log
np.dot(x,y)	Dot product
np.roots([1,0,-4])	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