Python Cheat Sheet: NumPy

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ame	Description	Example
.shape	The shape attribute of NumPy array a keeps a tuple of integers. Each integer describes the number of elements of the axis.	`a = np.array([[1,2],[1,1],[0,0]])` `print(np.shape(a))        # (3, 2)`
ndim	The ndim attribute is equal to the length of the shape tuple.	`print(np.ndim(a))           # 2`

	The asterisk (star) operator performs the Hadamard product, i.e., multiplies two matrices with equal shape element-wise.	`a = np.array([[2, 0], [0, 2]])`
		`b = np.array([[1, 1], [1, 1]])`
		`print(a*b)        # [[2 0] [0 2]]`

.matmul(a,b), a@b	The standard matrix multiplication operator. Equivalent to the @ operator.	`print(np.matmul(a,b))` `# [[2 2] [2 2]]`
.arange([start,]stop, step,])	Creates a new 1D numpy array with evenly spaced values	`print(np.arange(0,10,2))` `# [0 2 4 6 8]`
.linspace(start, stop, um=50)	Creates a new 1D numpy array with evenly spread elements within the given interval	`print(np.linspace(0,10,3))` `# [ 0.  5. 10.]`
.average(a)	Averages over all the values in the numpy array	`a = np.array([[2, 0], [0, 2]])` `print(np.average(a))        # 1.0`

slice> = <val>	Replace the <slice> as selected by the slicing operator with the value <val>.	`a = np.array([0, 1, 0, 0, 0])`
		`a[::2] = 2`
		`print(a)           # [2 1 2 0 2]`

.var(a)	Calculates the variance of a numpy array.	`a = np.array([2, 6])` `print(np.var(a))           # 4.0`
.std(a)	Calculates the standard deviation of a numpy array	`print(np.std(a))           # 2.0`

.diff(a)	Calculates the difference between subsequent values in NumPy array a	`fibs = np.array([0, 1, 1, 2, 3, 5])`
		`print(np.diff(fibs, n=1))`
		`# [1 0 1 1 2]`

.cumsum(a)	Calculates the cumulative sum of the elements in NumPy array a.	`print(np.cumsum(np.arange(5)))` `# [ 0  1  3  6 10]`

.sort(a)	Creates a new NumPy array with the values from a (ascending).	`a = np.array([10,3,7,1,0])`
		`print(np.sort(a))`
		`# [ 0  1  3  7 10]`

.argsort(a)	Returns the indices of a NumPy array so that the indexed values would be sorted.	`a = np.array([10,3,7,1,0])`
		`print(np.argsort(a))`
		`# [4 3 1 2 0]`

.max(a)	Returns the maximal value of NumPy array a.	`a = np.array([10,3,7,1,0])` `print(np.max(a))           # 10`
.argmax(a)	Returns the index of the element with maximal value in the NumPy array a.	`a = np.array([10,3,7,1,0])` `print(np.argmax(a))          # 0`
.nonzero(a)	Returns the indices of the nonzero elements in NumPy array a.	`a = np.array([10,3,7,1,0])` `print(np.nonzero(a))     # [0 1 2 3]`

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