# Module 6: Machine Learning Using Python – I

## Hands-on Guide

edureka!

## Summary of (most) Array Attributes/Methods

→ Basic Attributes

- » a.dtype – Numerical type of array elements. float32, uint8, etc.
- » a.shape – Shape of the array. (m,n,o,...)
- » a.size – Number of elements in entire array
- » a.itemsize – Number of bytes used by a single element in the array
- » a.nbytes – Number of bytes used by entire array (data only)
- » a.ndim – Number of dimensions in the array

→ Shape Operations

- » a.flat – An iterator to step through array as if it is 1D
- » a.flatten() – Returns a 1D copy of a multi-dimensional array
- » a.ravel() – Same as flatten(), but returns a 'view' if possible
- » a.resize(new_size) – Change the size/shape of an array in-place
- » a.swapaxes(axis1, axis2) – Swap the order of two axes in an array.
- » a.transpose(*axes) – Swap the order of any number of array axes.
- » a.T – Shorthand for a.transpose()
- » a.squeeze() – Remove any length=1 dimensions from an array

→ Fill and Copy

- » a.copy() – Return a copy of the array
- » a.fill(value) – Fill array with a scalar value

→ Conversion / Coercion

- » a.tolist() – Convert array into nested lists of values
- » a.tostring() – raw copy of array memory into a python string
- » a.astype(dtype) – Return array coerced to given dtype
- » a.byteswap(False) – Convert byte order (big <-> little endian)

→ Complex Numbers

- a.real – Return the real part of the array
- a.imag – Return the imaginary part of the array
- a.conjugate() – Return the complex conjugate of the array
- a.conj()– Return the complex conjugate of an array.(same as conjugate)

→ Saving

- a.dump(file) – Store a binary array data out to the given file.
- a.dumps() – Returns the binary pickle of the array as a string.
- a.tofile(fid, sep="", format="%s") Formatted ascii output to file.

→ Search / Sort

- a.nonzero() – Return indices for all non-zero elements in a.
- a.sort(axis=-1) – Inplace sort of array elements along axis.
- a.argsort(axis=-1) – Return indices for element sort order along axis.
- a.searchsorted(b) – Return index where elements from b would go in a.

→ Element Math Operations

- a.clip(low, high) – Limit values in array to the specified range.
- a.round(decimals=0) – Round to the specified number of digits.
- a.cumsum(axis=None) – Cumulative sum of elements along axis.
- a.cumprod(axis=None) – Cumulative product of elements along axis.

→ Reduction Methods

» All the following methods “reduce” the size of the array by 1 dimension by carrying out an operation along the specified axis. If axis is None, the operation is carried out across the entire array.

- » a.sum(axis=None) – Sum up values along axis.
- » a.prod(axis=None) – Find the product of all values along axis.
- » a.min(axis=None)– Find the minimum value along axis.
- » a.max(axis=None) – Find the maximum value along axis.
- » a.argmin(axis=None) – Find the index of the minimum value along axis.
- » a.argmax(axis=None) – Find the index of the maximum value along axis.
- » a.ptp(axis=None) – Calculate a.max(axis) – a.min(axis)
- » a.mean(axis=None) – Find the mean (average) value along axis.
- » a.std(axis=None) – Find the standard deviation along axis.
- » a.var(axis=None) – Find the variance along axis.
- » a.any(axis=None) – True if any value along axis is non-zero. (or)
- » a.all(axis=None) – True if all values along axis are non-zero. (and)