Day6

Numpy

NumPy

- NumPy is a Python library.
- NumPy stands for numeric python which is a python package for the computation and processing of the multidimensional and single dimensional array elements.

Installation

- Pip install numpy

NumPy Ndarray

- Ndarray is the n-dimensional array object defined in the numpy which stores the collection of the similar type of elements.
- a = numpy.array
- numpy.array(object, dtype = None, copy = True, order = None, subok = False, ndmin = 0)

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- Object:It represents the collection object. It can be a list, tuple, dictionary, set, etc.
- Dtype:We can change the data type of the array elements by changing this option to the specified type. The default is none.
- copy :It is optional. By default, it is true which means the object is copied.
- Order:There can be 3 possible values assigned to this option. It can be C (column order), R (row order), or A (any)
- Subok:The returned array will be base class array by default. We can change this to make the subclasses passes through by setting this option to true.
- Ndmin:It represents the minimum dimensions of the resultant array.

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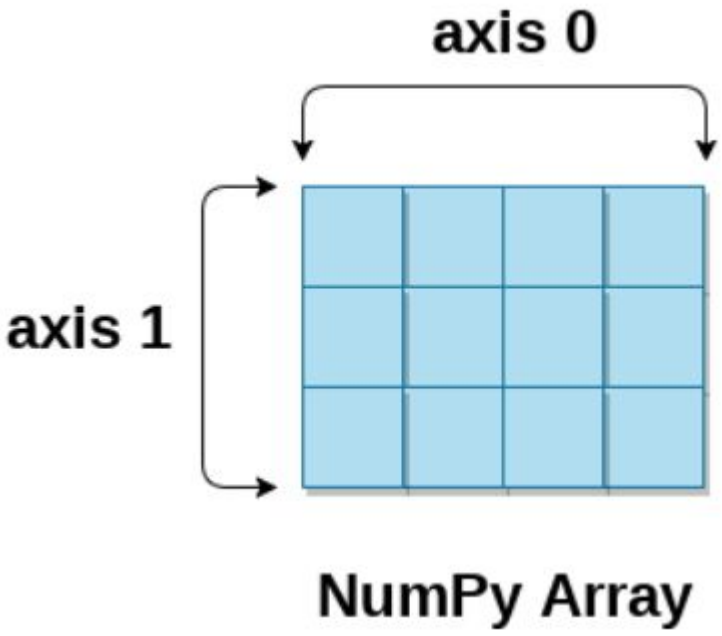
- A.itemsize –size of each data in bytes
- A.ndim –dimention of array
- A.dtype –type of items in array
- A.size –size of array
- A.shape –dimension of array

NumPy Array Axis

- A NumPy multi-dimensional array is represented by the axis where axis-0 represents the columns and axis-1 represents the rows.



Array Functions

- A.Reshape- changinging column and row order of the array
- A.Min()
- A.Max()
- A.Sum()
- Np.sqrt(a)
- Np.std(a)

Array slicing

- Array[start:end]
- Array[start:end:step]

Arithmetic operations in array

- A+b
- A-b
- A*b
- a/b

Array Concatenation

- a = np.array([[1,2,30],[10,15,4]])
- b = np.array([[1,2,3],[12, 19, 29]])
- Concatenate()
- Hstack()
- Vstack()
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Numpy Creating Arrays

- numpy.empty(shape, dtype = float, order = 'C’)
- Shape: The desired shape of the specified array.
- dtype: The data type of the array items. The default is the float.
- Order: The default order is the c-style row-major order. It can be set to F for FORTRAN-style column-major order.
- numpy.empty(shape, dtype = float, order = 'C’)
- numpy.ones(shape, dtype = none, order = 'C')
- numpy.zeros(shape, dtype = none, order = 'C')

Datatype conversion

- astype() function creates a copy of the array, and allows you to specify the data type as a parameter.
- newarr = arr1.astype('i')

Arrays from collections

- create an array by using the existing data in the form of lists, or tuples
- numpy.asarray(sequence, dtype = None, order = None)

Numpy Arrays within the numerical range

- It creates an array by using the evenly spaced values over the given interval.
- numpy.arrange(start, stop, step, dtype)

Array Iteration

- nditer : Iterator object used to iterate over the given array using python standard Iterator interface.

Copy and View

- The copy *owns* the data and any changes made to the copy will not affect original array, and any changes made to the original array will not affect the copy.
- X=arr.copy()
- The view *does not own* the data and any changes made to the view will affect the original array, and any changes made to the original array will affect the view.
- y=arr.view()

Sorting and Searching Arrays

- numpy.sort(input-array, axis, kind, order)
- Input-It represents the input array which is to be sorted.
- Axis- It represents the axis along which the array is to be sorted. If the axis is not mentioned, then the sorting is done along the last available axis.
- Kind-It represents the type of sorting algorithm which is to be used while sorting. The default is quick sort.
- order-It represents the filed according to which the array is to be sorted in the case if the array contains the fields.
- Numpy.where()-used for searching

Array Filter

- Getting some elements out of an existing array and creating a new array out of them is called filtering.
- We filter an array using a boolean index list in numpy.