IMPORTING NUMPY DATA

**import numpy as np**

*imports numpy using its alias as np*

**np.loadtxt(‘file.txt’)**

*creates an array from the selected text file*

**np.genfromtxt(‘file.csv’, delimeter=’,’)**

*create an array from csv file*

**np.savetxt(‘file.txt’,arr,delimiter=” ”)**

writes an array to a txt file

**np.savetxt(‘file.csv’,arr,delimiter=”,”)**

writes an array into a csv file

CREATING ARRAYS

**arr = np.array([1,2,3])**

*1D Array*

**arr=np.array([(1,1,2),(4,4,5)])**

*2D Array*

**arr=np.zeros(3,3)**

*3X3 matrix containing 0’s*

**arr=np.identity(5) OR arr=np.eye(5)**

*this creates identity matrix*

**arr=np.linespace(0,100,6)**

*Array of 6 evenly divided values from 0 to 100 ([0, 20, 40,60, 80, 100]*)

**arr=np.arange(0,10,3)**

*Array of values from 0 to less than 10 with step 3 ([0, 3, 6, 9])*

**arr=np.full((3,2),8)**

**arr=np.random.rand(3,3) | arr=np.random.randint(5,size=(3,3)) | arr=np.random.rand(3,3)\*100**

*This always returns random float values*

1. *3X3 matrix of random float values.*
2. *3X3 matrix of Only integer random values from 0-5(Exclusive).*
3. *3X3 matrix of radom floats between 0-100.*

**INSPECTING PROPERTIES**

**arr.astype(dtype=’int32’,’int64’,’float’)**

**arr.tolist()**

*converts arr to a python list*

**np.info(np.eye)**

*view documentation for np.eye*

**np.size**

*returns number of elements in arr*

**arr.shape**

*returns dimensions of arr(r,c)*

**arr.dtype**

*returns type of elements in array*

COPY,SORT & RESHAPE

**np.copy(arr)**

**arr.view(dtype)**

creates view of arr elements with type dtype

**arr.sort()**

sorts arr

**arr.sort(axis=0|1)** *sorts specific axis(0 for column 1 for row)*

**arr.flatten()**

*flattens 2D array arr to 1D*

**arr.T** *transpose of arr*

**arr.reshape(3,4)** *arr reshapes to 3X4*

**arr.resize((5,6))**

*changes arr shape to 5,6 and fills new values with 0.*

ADD & REMOVE

**np.append(arr, values)**

**np.insert(arr, 2, values)**

*inserts values into arr before index 2*

**np.delete(arr, 3, axis=0)**

*deletes row on index 3 of arr*

**np.delete(arr,4,aixs=1)**

*removes the 5th column from arr*

COMBINE & SPLIT

**np.concatenate((arr1, arr2),axis=0 or 1)**

*adds arr2 as rows/columns at the end of arr1*

**np.split(arr,x)**

*splits the array into x subarrays*

**np.hsplit(arr,x)**

*splits the array horizantally on the index x*

**INDEX AND SLICING**

**Arr[5]**

*Returns the element at index 5*

**Arr[2,5]**

*Returns the element at index [2][5] in 2D array*

**Arr[1]=4**

*Assigns 4 to at index 1*

**Arr[1,3]=20**

*arr[0:3] returs the elemnts at tge indices 0 1 2*

VECTOR MATHS

**np.power(arr1,arr2)**

*element wise raise arr1 to the arr2*

**np.array\_equal(arr1,arr2)**

*returns true if the both arrays have same vales and shape*

**np.sqrt(arr)**

*returns square root of eath element*

**np.sin(arr)**

*each elemnt sine value*

**np.log**

*naturqal log of each element*

**np.abs(arr)**

*absolute values of each element I the array*

**np.ceil(arr) & np.round(arr)**

*rounds up eat element to the nearest intergerr*

**np.floor(Arr)** *rounds down to the nearest integer*

Statistics Operations

**np.mean(arr, axis=0)**

*returns mean value of arr along the sspecified axxis*

**arr.sum()**

*return sum of all elements in the array*

**arr.min()**

*returns the minimum value of arr*

**arr.max(axis=0)**

*returns the maximum value of arr along specified axis.*

**np.var(arr)**

*returns the variance of arr*

**np.std(arr,axis=1)**

*returns the standard deviation of arr along specified axis*

**arr.corrcoef()**

*returns correlation coefficient of arr*