1. How to get 1, 2 or 3 dimension NumPy array?
2. How to resize NumPy array?
3. How to convert List or Tuple into NumPy array?
4. How to create NumPy array using arange function?
5. How to create NumPy arrays with linspace()?
6. NumPy logspace array example
7. NumPy Full array example
8. NumPy Eye array example

# NumPy generate random number array

Description:1. The np.random.rand method, generates an array with random numbers that are uniformly distributed between 0 and 1.

2.The np.random.randn method, generates an array with random numbers that are normally distributed between 0 and 1.

1. The np.random.randint method, generates an array with random numbers that are uniformly distributed between 0 and given integer.
2. NumPy Identity and Diagonal Array Example

Note:The identity() function, generates square array with ones on the main diagonal whereas diag() function extract or construct diagonal array.

# NumPy Indexing in Multidimensional array

* Note: Indexing in a 3-Dimensional Array is based on syntax: array3d[L,M,N] where L is the first index, M is the row no. and N is the column no.

1. NumPy Single Dimensional Slicing Examples
2. Multidimensional Slicing in NumPy Array
3. Flips the order of the axes of an NumPy Array

* Description:
  + The transpose function transpose also exists as a method in ndarray and it permute the dimensions of an array.
  + The fliplr (flip left-right) and flipud (flip up-down) functions perform operations that are similar to the transpose and the shape of the output array is the same as the input.
  + The fliplr flip an array in the left/right direction. The flipud flip an array in the up/down direction. The rot90 Rotate an array by 90 degrees in the plane specified by axes and the rotation direction is from the first towards the second axis.

1. Joining and Stacking of NumPy arrays

Description:

* NumPy uses the concept of stacking and provide a number of functions to perform: vertical stacking(row wise) using vstack(), horizontal stacking(column wise) using hstack() and depth wise stacking(along third axis) using dstack().
* The concatenate() function creates a new array by appending arrays after each other, along a given axis. The append() function appends an element to an array and creates a new copy of the array.

1. NumPy Elementary Mathematical Functions

These mathematical functions takes a single array of any dimension as input and returns a new array of the same shape.

|  |  |
| --- | --- |
| Functions | Description |
| np.cos(), np.sin(), np.tan() | Trigonometric functions. |
| np.arccos(), np.arcsin(), np.arctan() | Inverse trigonometric functions. |
| np.cosh(), np.sinh(), np.tanh() | Hyperbolic trigonometric functions. |
| np.arccosh(), np.arcsinh(), np.arctanh() | Inverse hyperbolic trigonometric unctions. |
| np.sqrt() | Square root. |
| np.exp() | Exponential. |
| np.log(), np.log2(), np.log10() | Logarithms of base e, 2, and 10, respectively. |

1. NumPy Element Wise Mathematical Operations

|  |  |
| --- | --- |
| Functions | Description |
| np.add(), np.subtract(), np.multiply(), np.divide() | Addition, subtraction, multiplication, and division of arguments(NumPy arrays) element-wise. |
| np.power() | First array elements raised to powers from second array, element-wise. |
| np.remainder() | Return element-wise remainder of division. |
| np.reciprocal() | Return the reciprocal of the argument, element-wise. |
| np.sign(), np.abs() | Return sign and the absolute value. |
| np.floor(), np.ceil() | Return the floor, ceiling of the input, element-wise. |
| np.round() | Round a number to a given precision in decimal digits (default 0 digits). |

1. NumPy Aggregate and Statistical Functions

|  |  |
| --- | --- |
| Functions | Description |
| np.mean() | Compute the arithmetic mean along the specified axis. |
| np.std() | Compute the standard deviation along the specified axis. |
| np.var() | Compute the variance along the specified axis. |
| np.sum() | Sum of array elements over a given axis. |
| np.prod() | Return the product of array elements over a given axis. |
| np.cumsum() | Return the cumulative sum of the elements along a given axis. |
| np.cumprod() | Return the cumulative product of elements along a given axis. |
| np.min(), np.max() | Return the minimum / maximum of an array or minimum along an axis. |
| np.argmin(), np.argmax() | Returns the indices of the minimum / maximum values along an axis |
| np.all() | Test whether all array elements along a given axis evaluate to True. |
| np.any() | Test whether any array element along a given axis evaluates to True. |

1. NumPy Example of Where function

Description:The where() function is used to chooses values from arrays depending on the value of a specific condition.

1. NumPy Example of Select function

Description:The select() function return an array drawn from elements in choice list, depending on conditions.

1. NumPy Logical operations for selectively picking values from an array depending on a given condition

Note:logical\_or computes the truth value of x1 OR x2 element-wise.

logical\_and computes the truth value of x1 AND x2 element-wise.

 logical\_or computes the truth value of NOT x element-wise.

1. NumPy example of Standard Set Operations

Note:The standard set operations union (array of values that are in either of the two input arrays), intersection (unique values that are in both of the input arrays), and difference (unique values in array1 that are not in array2) are provided by np.union1d(), np.intersect1d(), and np.setdiff1d(), respectively.