

G. H. Rasoni College Of Engineering And Management, Wagholi Pune

2021- 2022

Group B :-Assignment no :- 2

Department	<u>CE [SUMMER 2022 (Online)]</u>		
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Subject Name /Code	<u>Python for Data Science / UCSP204</u>		
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Group B → Experiment No 2

Aim → Write a Python Function that takes two numpy ndarray objects, checks if they are the same shape (printing Error and aborting if they aren't), then raises the numbers b of the second array to the exponents a in the first array. Do this without using numpy Functions like `numpy.power` in your function. Make sure that it works with differently sized numpy arrays arrays of 0 dimension, 1 dimension and 2 dimension. Do the same using the `numpy.power` Function.

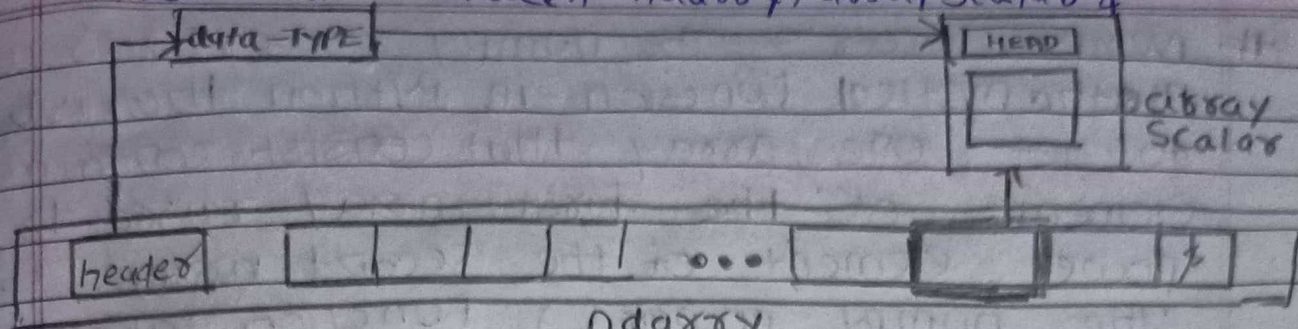
Theory →

Numpy Array: Numpy is a python package that stands for Numerical Python core library for scientific computing. Usefull in linear algebra, random number capability etc. also used an efficient multi-dimensional container for generic data.

Numpy ndarray → A multi-dimensional array object.

The most important object defined in Numpy is an N-dimensional array type called ndarray. It describes the collection of items of the same type. Items in the collection can be accessed using a zero-based index. Every item in a ndarray takes object (by sharing) is represented by a python object of one of array scalar types.

relationship Between ndarray, array Scalar



data type object (dtype)

basic ndarray is created using an array function in Numpy
→ `numpy.array`

creating array

easiest way is using array function

This accepts any sequence-like object (including other arrays) and produces a new Numpy array containing the passed data

```
Ex → import numpy as np
data = [6, 7, 8, 9]
array1 = np.array(data)
print(array1)
```

Shape of Array:

The `numpy.shape()` function gives us the number of elements in each dimension of an array. `numpy.shape()` returns a tuple that contains the number of elements in each dimension of an array.

```
Ex → import numpy as np
arr = np.array([[1, 2, 3], [4, 5, 6]])
print(np.shape(arr))
```


Numpy Power \rightarrow The `numpy.power()` is a mathematical function in Python that is used to get one array that consists contains elements of the first array raised to the power element of the second array.

The `numpy.power()` function takes two main arguments: (1) The array of base
(2) The array of exponent

The `numpy.power()` returns the array with elements of the first array raised to the power element of the second array.

This means if we have two arrays (must be of the same size) `arr1` and `arr2`, then `numpy.power()` will calculate `arr1i ^ arr2i` for each $i = 0$ to `Size of array - 1`.

If the values of `arr2` are not +ve, then this function will return a `ValueError`.

Syntax:

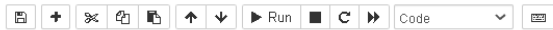
`numpy.power(arr_of_base, arr_of_exp, out=None, where=True, casting='same_kind', order='K', dtype=None)`

Group B Assignment 2 program code

```
print("*****")
print("SCOB77_Pratham pittu_Group B Assignment 2")
print("*****")
print("\n-----")
import numpy as np
arr1 = np.array([[1,2,3],[4,5,6]])
arr2 = np.array([[7,8,9],[2,2,2]])

if arr1.shape !=arr2.shape:
    print ("Error: Given arrays are of not same size")
else:
    print ("Exponential of 2nd on 1st array is: \n" , arr1**arr2)
print("-----")

#Using the built in power function
import numpy as np
arr1 = np.array([[1,2,3],[4,5,6]])
arr2 = np.array([[7,8,9],[2,2,2]])
if arr1.shape !=arr2.shape:
    print ("Error: Given arrays are of not same size")
else:
    print ("Exponential of 2nd on 1st array is using built in function:\n" , np.power(arr1,arr2))
```



```
In [17]: print("*****")
print("SCOB77_Pratham pitty_Group B Assignment 2")
print("*****")
print("\n-----")
import numpy as np
arr1 = np.array([[1,2,3],[4,5,6]])
arr2 = np.array([[7,8,9],[2,2,2]])

if arr1.shape !=arr2.shape:
    print ("Error: Given arrays are of not same size")
else:
    print ("Exponential of 2nd on 1st array is: \n" , arr1**arr2)
print("-----")

#Using the built in power function
import numpy as np
arr1 = np.array([[1,2,3],[4,5,6]])
arr2 = np.array([[7,8,9],[2,2,2]])
if arr1.shape !=arr2.shape:
    print ("Error: Given arrays are of not same size")
else:
    print ("Exponential of 2nd on 1st array is using built in function:\n" , np.power(arr1,arr2))

*****
SCOB77_Pratham pitty_Group B Assignment 2
*****

-----
Exponential of 2nd on 1st array is:
[[ 1 256 19683]
 [ 16 25 36]]
-----
Exponential of 2nd on 1st array is using built in function:
[[ 1 256 19683]
 [ 16 25 36]]
```