



Marwadi
University
Marwadi Chandarana Group

MARWADI EDUCATION FOUNDATION'S GROUP OF INSTITUTIONS
GAURIDAD CAMPUS, RAJKOT
DEPARTMENT OF INFORMATION AND COMMUNICATION TECHNOLOGY

**Data Science Libraries and
Implementation
Date: 14-11-2024
Event Report**



+ Work and Flow of Event:

The event titled “Data Science Libraries and Implementation” organized by the Data Science Club based at MA102 for Diploma students from the ICT department was systematic and interesting. It started as the members of the Data Science Club stated its aims and explained its relevance in the data science and data visualization processes under the supervision of Professor Nishith Kotak. Following this, there was a shift in perspective towards the fundamentals of data mastered science which is interdisciplinary and has real-world relevance. Next, the audience was provided with an in-depth presentation about the NumPy library and its key characteristics relevant to data analysis. Numerous practical examples illustrated NumPy’s potential for tasks such as creating, indexing, slicing, and sorting, as well as concatenating arrays. An exposure session to address these issues was held to ensure that the participants were well acquainted with the theoretical and practical aspects of such topics, in a stimulating and productive manner.

1. About DS club:

The session starts with the introduction of DS Club, developed by students of ICT department and guided by Professor Nishith Kotak of ICT department, aims to explore vastness of Data Science and Data visualization. The club also aims to teach their members that how data can be used to find conclusions and make correct decision after correct analysis of data.

2. What is Data Science?

Data science is a field that uses data to create insights and strategies for businesses and industries. It's a multidisciplinary field that combines principles and practices from many other areas, including: mathematics, statistics, business, artificial intelligence, and computer engineering.

3. Introduction to Numpy Library:

The numpy library is widely used in python to store the data and using the data we can perform its analysis. NumPy, short for Numerical Python, is a



powerful library for numerical computations in Python. It provides efficient array operations, linear algebra functions, random number generation, and more. This makes it a fundamental tool for data scientists, machine learning engineers, and researchers.

4. Getting started with numpy:

To start or use numpy you need to install numpy in Python using command: “pip install numpy”. It will install all the required packages to use numpy. And after installation you need to import the numpy using command: “import numpy as np” on compiler. It provides efficient array operations and linear algebra functions.

5. Creating arrays using numpy:

NumPy offers various ways to create arrays:

- **From Python lists:** `np.array([1, 2, 3])`
- **Using:** `np.zeros()`, `np.ones()`, or `np.full()`: `np.zeros(3)`
- **Using:** `np.arange()`: `np.arange(10)`
- **Using:** `np.linspace()`: `np.linspace(0, 10, 5)`
- **Using:** `np.random.rand()`, `np.random.randn()`, or `np.random.randint()`:
`np.random.rand(3, 3)`

We will use the first way of creating array as it is the basic one. As a beginner we should use it for better understanding.

6. Array Indexing using numpy:

In array indexing you can access the element of array using its index number. For example, we create an array of three element and you want to know the value of third element, you can find the value using array indexing:

```
arr = np.array([1, 2, 3])  
print(arr[0])
```



It will print 1 because '0' is the index number of '1'. Also index number of array starts with 0 so if you want to access nth element you need to give n-1 number to array.

7. Array Slicing using numpy:

Slicing extracts a portion of an array. We can also say that when we need sub array of original array we can use slicing. For example we have an array of 5 elements we need to access three out them at that time we can you slicing of array:

```
arr = np.array([1, 2, 3, 4, 5])  
print(arr[1:4])
```

It will print [2,3,4] because '1' is the index number from where you need to start and '4' is the value where you need to stop , i.e from index 1 to element 4.

8. NumPy Data Types:

NumPy arrays have specific data types. We can check the data type of an array using dtype. For example :

```
arr = np.array([1, 2, 3], dtype='float32')  
print(arr.dtype)
```

It will print 'float32'.

9. NumPy Array shape:

The shape attribute of a NumPy array provides a tuple representing the dimensions of the array. Each element in the tuple corresponds to the size of the array along that dimension.

Example:

```
arr = np.array([[1, 2, 3], [4, 5, 6]])  
print(arr.shape)
```



It will print (2,3) where, 2 is the number of rows and 3 is the number of columns in the array. In short, we can say that it will print dimensions of array.

10. Join two numpy arrays:

The `np.concatenate()` function is used to join or concatenate two or more arrays along a specified axis. The axis parameter determines the dimension along which the arrays are joined.

Example:

```
arr1 = np.array([1, 2, 3])
arr2 = np.array([4, 5, 6])
arr3 = np.concatenate((arr1, arr2))
print(arr3)
```

It will print [1,2,3,4,5,6] because now arr3 is the combination of arr1 and arr2.

11. Splitting the numpy array:

The `np.split()` function divides an array into multiple sub-arrays along a specified axis. The `indices_or_sections` parameter determines the positions or number of sections to split the array.

Example:

```
arr = np.array([1, 2, 3, 4, 5, 6])
arr1, arr2, arr3 = np.split(arr, 3)
print(arr1, arr2, arr3)
```

It will print [1,2], [3,4], [5,6] because we use `split()` command which will split the array in n parts.

12. Searching indices of array:



The `np.where()` function is used to find the indices of elements in an array that satisfy a given condition. It returns a tuple of arrays, where each array contains the indices of elements that meet the condition.

Example:

```
arr = np.array([1, 2, 3, 4, 5])  
indices = np.where(arr > 2)  
print(indices)
```

It will print the indices of elements which are greater than 2 if not then it will print zero. Here the output will be (2,3,4).

13. Sorting the Array:

The `np.sort()` function sorts the elements of an array in ascending order. You can also specify the axis parameter to sort along a specific dimension.

Example:

```
arr = np.array([3, 1, 4, 1, 5, 9, 2, 6, 5, 3, 5])  
arr_sorted = np.sort(arr)  
print(arr_sorted)
```

It will print the array in ascending order, i.e from smaller to Higher number.

Here output will be [1,1,2,3,3,4,5,5,5,6,9].

Photos:







List Of Participants:

GR NO	EN Roll No	Participate Name
120696	92301733005	HELENA AFONSO CHONGO
122354	92301733042	ANSH VIPUL RAYTHATHA
122580	92301733050	JYOTINDRASINH PARMAR
122298	92301733041	MILAN DINESHBHAI JANI
122434	92301733046	SHIVAM ATULKUMAR BHATT
120736	92301733013	MIT JAYESH SOLANKI
122779	92301733056	BUGGITTINA SHIVA KUMAR
122731	92301733054	NIKHILKUMAR JAYESHBHAI BHANDERI
122441	92301733062	ADITYA RAJ
121771	92301733029	BHARGAV MAHESHBHAI LIMBANI
120914	92301733022	OM CHANDULAL MAKADIYA
123073	92301733066	KAVYA CHIRAGBHAI THAKAR
121695	92301733027	VIRAJ PRAKASHBHAI VAGHASIYA
120692	92301733003	ALBEIJA BERNADETE LOLA LAISSANE
120891	92301733021	YASH JAYESHBHAI VEKARIYA
120720	92301733011	HIRCEL CIRZETH VIRGILIO ZACARIAS
120945	92301733024	ISHA DEVENDRABHAI SAVALIYA
123043	92301733064	KATHAN KAMLESH KANSAGARA
120704	92301733006	ZEENAT ABDULCADRE ABUCHIR DOSSO
122247	92301733039	DISHANT SHAILESHBHAI RUPAPARA
122405	92301733043	BHAVIN PANKAJBHAI MUCHHALA
120717	92301733012	ADELAIDE FELICIANO LAMPPIO MIGUEL

122820	92301733057	PAYAL MAKWANA
122473	92301733047	RAJ TULSHIBHAI TALA
121063	92301733025	MIHIR MALIKALI MITHANI
120815	92301733016	ASHUTOSH KUMAR SINGH
123042	92301733063	ANGEL OZA
121725	92301733028	DISHA PARESHBHAI VADOLIYA
120824	92301733017	HARSH VISHALBHAI TRIVEDI
121249	92301733036	NIKI MAJITHIYA
123014	92301733060	KRUSHANG KAMLESHBHAI SAVALIYA

Feedback Form:

 Marwadi University
Marwadi Chandernagore Group

Club Name: DATA SCIENCE CLUB Date: 11/14/24

Event Name: DATA SCIENCE LIBRARIES AND IMPLEMENTATION

How would you rate the overall event experience?(Select one)

Poor
 Average
 Good
 Very Good
 Excellent

How satisfied were you with the quality of the speakers/presenters?(Select one)

Highly Satisfied
 Satisfied
 Neutral
 Dissatisfied
 Highly dissatisfied

How satisfied were you with the flow of the event?(Select one)

Highly Satisfied
 Satisfied
 Neutral
 Dissatisfied
 Highly dissatisfied

Was the content relevant to your technical interests and knowledge level?(Select one)

Extremely Relevant
 Slightly Relevant
 Neutral
 Slightly Relevant
 Not relevant at all

Any Other comments that you would like to mention?

Session was good learnt about the library and explored new features.

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Extremely Relevant
 Slightly Relevant
 Neutral
 Slightly Relevant
 Not relevant at all

Any Other comments that you would like to mention?

The event was quite insightful, The speakers did a good job.