Data Analysis using Python

25 – Marks Internal (weekly quiz and viva)
50- Practical exam

25 – Theory exam

Online platform for run Python programs :-

https://www.tutorialspoint.com/execute_python_online.php

Data Science: is a branch of computer science where we study how to store, use and analyze data for deriving information from it.

Python is distinguished by its large and active scientific computing community in both industry application and academic research

For data analysis and interactive, exploratory computing and data visualization python will in evitable draw comparisons.

the Cython project (https://cython.org/) has become one of the preferred ways of both creating fast compiled extensions for Python and also interfacing with C and C++ code

Note: This shows you how to use LISTS as ARRAYS, however, to work with arrays in Python you will have to import a library, like the NumPy library.

What is an Array?

An array is a special variable, which can hold more than one value at a time.

If you have a list of items (a list of city names, for example), storing the city in single variables could look like this:

City1 = Kota

City2 = Jaipur

City3 = Delhi

And what if you had not 3 city, but 3000? The solution is an array!

An array can hold many values under a single name, and you can access the values by referring to an index number.

Access the Elements of an Array

You refer to an array element by referring to the *index number*.

City = [‘Kota’, ‘Jaipur’, ‘Delhi’]

Use the len() method to return the length of an array (the number of elements in an array).

```
x = len(City)
```

Note: The length of an array is always one more than the highest array index.

Looping Array element

```
for record in city:
  print(record)
```

Python Classes/Objects

Python is an object oriented programming language.

Almost everything in Python is an object, with its properties and methods.

A Class is like an object constructor, or a "blueprint" for creating objects.

Try this

```
class MyClass
        x = 5

p1=MyClass()
print(p1.x)
```

Anaconda Distribution:- it includes python numpy, and other commonly used package for scientific computing and data science.

Numpy can be installed with conda, with pip or with a package manager on macOS an Linux

CONDA

```
Conda install numpy
```

PIP

```
Pip install numpy
```

On all windows, macOS and Linux

- ⇨ Install Anaconda, Pycharm
- ⇨ For writing and executing code use notebooks in JupyterLab for exploratory and interactive computing and spyder: visual studio C

NumPy:- NumPy, short for Numerical Python, is the foundational package for scientific computing in Python.

The array object in NumPy is called ndarray, it provides a lot of supporting functions that make working with ndarray very easy.

• A fast and efficient multidimensional array object ndarray -50*

• Functions for performing element-wise computations with arrays or mathematical operations between arrays

• Tools for reading and writing array-based data sets to disk

• Linear algebra operations, Fourier transform, and random number generation

• Tools for integrating connecting C, C++, and Fortran code to Python

Example: Try this

```
Import  numpy

x = [1, 2, 3, 4, 5]

arr = numpy.array(x)

print(arr)
```

Create an alias with the as keyword while importing:

```
import numpy as np

import numpy as np

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

print(arr)
```

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