**Some Basic Question & Answer on Python**

1. **Define the Pandas/Python pandas?**

Ans 1. Pandas is defined as an open-source library that provides high-performance data manipulation in Python. The name of Pandas is derived from the word Panel Data, which means an Econometrics from Multidimensional data. It can be used for data analysis in Python and developed by Wes McKinney in 2008. It can perform five significant steps that are required for processing and analysis of data irrespective of the origin of the data, i.e., load, manipulate, prepare, model, and analyze.

1. **Mention the different types of Data Structures in Pandas?**

Ans 2. Pandas provide two data structures, which are supported by the pandas library, Series, and Data Frames. Both of these data structures are built on top of the NumPy.

A Series is a one-dimensional data structure in pandas, whereas the DataFrame is the two-dimensional data structure in pandas.

### How can we calculate the standard deviation from the Series?

Ans 3. The Pandas **std()** is defined as a function for calculating the standard deviation of the given set of numbers, Data Frame, column, and rows.

**Series.std(axis=None, skipna=None, level=None, ddof=1, numeric\_only=None, \*\*kwargs)**

### Define Data Frame in Pandas?

Ans 4. A DataFrame is a widely used data structure of pandas and works with a two-dimensional array with labeled axes (rows and columns) DataFrame is defined as a standard way to store data and has two different indexes, i.e., row index and column index. It consists of the following properties:

* The columns can be heterogeneous types like int and bool.
* It can be seen as a dictionary of Series structure where both the rows and columns are indexed. It is denoted as "columns" in the case of columns and "index" in case of rows.

### What are the significant features of the pandas Library?

Ans 5. The key features of the panda's library are as follows:

* Memory Efficient
* Data Alignment
* Reshaping
* Merge and join
* Time Series

1. **Define the different ways a DataFrame can be created in pandas?**

Ans 6. We can create a DataFrame using following ways:

* Lists
* Dict of ndarrays

1. **Create a DataFrame using List:**
2. import pandas as pd
3. # a list of strings
4. a = ['Python', 'Pandas']
5. # Calling DataFrame constructor on list
6. info = pd.DataFrame(a)
7. print(info)
8. **Create a DataFrame from dict of ndarrays:**
9. import pandas as pd
10. info = {'ID' :[101, 102, 103],'Department' :['B.Sc','B.Tech','M.Tech',]}
11. info = pd.DataFrame(info)
12. print (info)
13. **How will you create a series from dict in Pandas?**

Ans 7. A Series is defined as a one-dimensional array that is capable of storing various data types.

We can create a Pandas Series from Dictionary:

Create a Series from dict:

We can also create a Series from dict. If the dictionary object is being passed as an input and the index is not specified, then the dictionary keys are taken in a sorted order to construct the index.

If index is passed, then values correspond to a particular label in the index will be extracted from the dictionary.

1. import pandas as pd
2. import numpy as np
3. info = {'x' : 0., 'y' : 1., 'z' : 2.}
4. a = pd.Series(info)
5. print (a)
6. **How will you create an empty DataFrame in Pandas?**

Ans 8. A DataFrame is a widely used data structure of pandas and works with a two-dimensional array with labeled axes (rows and columns) It is defined as a standard way to store data and has two different indexes, i.e., row index and column index.

Create an empty DataFrame:

The below code shows how to create an empty DataFrame in Pandas:

1. # importing the pandas library
2. import pandas as pd
3. info = pd.DataFrame()
4. print (info)
5. **How will you add a column to a pandas DataFrame?**

Ans 9. We can add any new column to an existing DataFrame. The below code demonstrates how to add any new column to an existing DataFrame:

1. # importing the pandas library
2. import pandas as pd
3. info = {'one' : pd.Series([1, 2, 3, 4, 5], index=['a', 'b', 'c', 'd', 'e']),
4. 'two' : pd.Series([1, 2, 3, 4, 5, 6], index=['a', 'b', 'c', 'd', 'e', 'f'])}
6. info = pd.DataFrame(info)
8. # Add a new column to an existing DataFrame object
9. print ("Add new column by passing series")
10. info['three']=pd.Series([20,40,60],index=['a','b','c'])
11. print (info)
12. print ("Add new column using existing DataFrame columns")
13. info['four']=info['one']+info['three']
14. print (info)
15. **How to get the minimum, 25th percentile, median, 75th, and max of a numeric series?**

Ans 10. We can compute the minimum, 25th percentile, median, 75th, and maximum of p as below example:

1. import pandas as pd
2. import numpy as np
3. p = pd.Series(np.random.normal(14, 6, 22))
4. state = np.random.RandomState(120)
5. p = pd.Series(state.normal(14, 6, 22))
6. np.percentile(p, q=[0, 25, 50, 75, 100])

### How can we convert DataFrame into an excel file?

Ans 11. We can export the DataFrame to the excel file by using the **to\_excel()** function.

To write a single object to the excel file, we have to specify the target file name. If we want to write to multiple sheets, we need to create an **ExcelWriter** object with target filename and also need to specify the sheet in the file in which we have to write.

1. **How can we sort the DataFrame?**

Ans 12. We can efficiently perform sorting in the DataFrame through different kinds:

* By label
* By Actual value

By label

The DataFrame can be sorted by using the sort\_index() method. It can be done by passing the axis arguments and the order of sorting. The sorting is done on row labels in ascending order by default.

By Actual Value

It is another kind through which sorting can be performed in the DataFrame. Like index sorting, sort\_values() is a method for sorting the values.

It also provides a feature in which we can specify the column name of the DataFrame with which values are to be sorted. It is done by passing the 'by' argument.

1. **What is Numpy?**

**Ans 13.**NumPy is a general-purpose array-processing package. It provides a high-performance multidimensional array object, and tools for working with these arrays. It is the fundamental package for scientific computing with Python. … A powerful N-dimensional array object. Sophisticated (broadcasting) functions.

1. **Why NumPy is used in Python?**

**Ans 14. NumPy** is a package in **Python used** for Scientific Computing. **NumPy** package is **used** to perform different operations. The ndarray (**NumPy** Array) is a multidimensional array **used** to store values of same datatype. These arrays are indexed just like Sequences, starts with zero.

1. **Where is NumPy used?**

**Ans 15. NumPy** is an open source numerical Python library. **NumPy** contains a multi-dimensional array and matrix data structures. It can be utilized to perform a number of mathematical operations on arrays such as trigonometric, statistical and algebraic routines. **NumPy** is an extension of Numeric and Num array.

1. **how to create 1D Array ?**

**Ans 16.**  
num=[1,2,3]  
num = np.array(num)  
print(“1d array : “,num)

**17. how to create 2D Array ?**

**Ans 17.**  
num2=[[1,2,3],[4,5,6]]  
num2 = np.array(num2)  
print(“\n2d array : “,num2)

**18. how to create 3D Array or ND Array ?**

**Ans 18.**  
num3=[[[1,2,3],[4,5,6],[7,8,9]]]  
num3 = np.array(num3)  
print(“\n3d array : “,num3)

**19. how to use shape for 1D Array ?**

**Ans 19.**  
num=[1,2,3] if not defined  
print(‘\nshpae of 1d ‘,num.shape)

**20. how to use shape for 2D Array ?**

**Ans 20.**

num2=[[1,2,3],[4,5,6]] if not added  
print(‘\nshpae of 2d ‘,num2.shape)

**21. how to use shape for 3d or Nd Array ?**

**Ans 21.**

num3=[[[1,2,3],[4,5,6],[7,8,9]]] if not added  
print(‘\nshpae of 3d ‘,num3.shape)

**22. How to replace items that satisfy a condition without affecting the original array?**

Ans 22.

arr = np.arange(10)

out = np.where(arr % 2 == 1, -1, arr)

print(arr)

out

**23. How to stack two arrays vertically?**

Ans 23.

a = np.arange(10).reshape(2,-1)

b = np.repeat(1, 10).reshape(2,-1)

# Answers

# Method 1:

np.concatenate([a, b], axis=0)

# Method 2:

np.vstack([a, b])

# Method 3:

np.r\_[a, b]

**24. How to get the positions of top**n**values from a numpy array?**

Ans 24.

Get the positions of top 5 maximum values in a given array a

# Input

np.random.seed(100)

a = np.random.uniform(1,50, 20)

# Solution:

print(a.argsort())

#> [18 7 3 10 15]

# Solution 2:

np.argpartition(-a, 5)[:5]

#> [15 10 3 7 18]

# Below methods will get you the values.

# Method 1:

a[a.argsort()][-5:]

# Method 2:

np.sort(a)[-5:]

# Method 3:

np.partition(a, kth=-5)[-5:]

# Method 4:

a[np.argpartition(-a, 5)][:5]

**25. How to create an empty and a full NumPy array?**

|  |
| --- |
| Ans 25.  # python program to create  # Empty and Full Numpy arrays    import numpy as np      # Create an empty array  empa = np.empty((3, 4), dtype=int)  print("Empty Array")  print(empa)    # Create a full array  flla = np.full([3, 3], 55, dtype=int)  print("\n Full Array")  print(flla) |

**Some Basic Question on Python**

1. What are Keywords in Python?
2. What are functions in Python?
3. [Python program to add two numbers](https://www.geeksforgeeks.org/python-program-to-add-two-numbers/)
4. [Python program to Subtract two numbers](https://www.geeksforgeeks.org/python-program-to-add-two-numbers/)..
5. [Python program to Divide two numbers](https://www.geeksforgeeks.org/python-program-to-add-two-numbers/).
6. [Python Program for simple interest](https://www.geeksforgeeks.org/python-program-for-simple-interest/).
7. [Python program to Divide & Multiply in a single program with two numbers](https://www.geeksforgeeks.org/python-program-to-add-two-numbers/).
8. [Maximum of two numbers in Python](https://www.geeksforgeeks.org/maximum-of-two-numbers-in-python/).
9. [Python Program for factorial of a number](https://www.geeksforgeeks.org/python-program-for-factorial-of-a-number/).
10. [Python Program for compound interest](https://www.geeksforgeeks.org/python-program-for-compound-interest/).
11. [Python Program to check Armstrong Number](https://www.geeksforgeeks.org/python-program-to-check-armstrong-number/).
12. [Python Program for Program to find area of a circle](https://www.geeksforgeeks.org/python-program-for-program-to-find-area-of-a-circle/).
13. [Python program to print all Prime numbers in an Interval](https://www.geeksforgeeks.org/python-program-to-print-all-prime-numbers-in-an-interval/).
14. [Python program to check whether a number is Prime or not](https://www.geeksforgeeks.org/python-program-to-check-whether-a-number-is-prime-or-not/).
15. [Python Program for n-th Fibonacci number](https://www.geeksforgeeks.org/python-program-for-n-th-fibonacci-number/).
16. [Python Program for How to check if a given number is Fibonacci number?](https://www.geeksforgeeks.org/python-program-for-how-to-check-if-a-given-number-is-fibonacci-number/)
17. [Python Program for n\’th multiple of a number in Fibonacci Series](https://www.geeksforgeeks.org/python-program-for-nth-multiple-of-a-number-in-fibonacci-series/).
18. [Program to print ASCII Value of a character](https://www.geeksforgeeks.org/program-print-ascii-value-character/).
19. [Python Program for Sum of squares of first n natural numbers](https://www.geeksforgeeks.org/python-program-for-sum-of-squares-of-first-n-natural-numbers/).
20. [Python Program for cube sum of first n natural numbers](https://www.geeksforgeeks.org/python-program-for-program-for-cube-sum-of-first-n-natural-numbers/).

Answer:

Ans 1. The keywords are **some predefined and reserved words in python that have special meanings**. Keywords are used to define the syntax of the coding. The keyword cannot be used as an identifier, function, and variable name. All the keywords in python are written in lower case except True and False.

Ans 2. In Python, defining the function works as follows. def is the keyword for defining a function. **The function name is followed by parameter(s)** in (). ... After function definition is complete, calling the function with an argument returns a value.

Ans 3.

a = int(input("enter first number: "))

b = int(input("enter second number: "))

sum = a + b

print("sum:", sum)

Ans 4.

a = 10

b = 7

number = a - b

print(number)

Ans 5.

a=250

b=25

div=a/b;

print("The division of {0} and {1} is: {2}".format(a,b,div))

Ans 6.

Input : P = 10000

R = 5

T = 5

Output :2500

We need to find simple interest on

Rs. 10,000 at the rate of 5% for 5

units of time.