

1. What is Python? Name some features of Python and Explain how it different than java or any other languages?

Ans: Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. Its high-level built in data structures, combined with dynamic typing and dynamic binding, make it very attractive for Rapid Application Development, as well as for use as a scripting or glue language to connect existing components together.

There are many features in Python -

1. Easy to code
2. Free and Open Source
3. Object-Oriented Language
4. High-Level Language
5. Python is Portable language
6. Interpreted Language
7. Python is Integrated language

Both Python and Java are high-level programming languages. But Python is an interpreted programming language. The developers have to use operating system specific Python interpreters to execute the Python code directly. They even have option to choose from several implementations of the programming language. On the other hand, Java is a compiled programming language. The Java code is initially compiled into bytecode that runs on any device or platform with Java Virtual Machine. However, the developers can further port the compiled Java code from one platform to another seamlessly.

2. What are the supported data types in python?

Text Type: str
Numeric Types: int, float, complex
Sequence Types: list, tuple, range
Mapping Types: dict
Set Types: set, frozenset
Boolean Types: bool
Binary Types: bytes, bytearray, memoryview

3. What is difference between list, tuple and dictionary? Is array in C is same as list in Python?

List and Tuple objects are sequences. A dictionary is a hash table of key-value pairs. List and tuple is an ordered collection of items. Dictionary is unordered collection.

List and dictionary objects are mutable i.e. it is possible to add new item or delete and item from it. Tuple is an immutable object. Addition or

deletion operations are not possible on tuple object.

List and tuple items are indexed. Slice operator allows item of certain index to be accessed. Items in dictionary are not indexed. Value associated with a certain key is obtained by putting in square bracket. The `get()` method of dictionary also returns associated value.

4. Name the few libraries in python used for data analysis and scientific computations?

Numpy and Scipy – Fundamental Scientific Computing
Pandas – Data Manipulation and Analysis
Matplotlib – Plotting and Visualization
Scikit-learn – Machine Learning and Data Mining
StatsModels – Statistical Modeling, Testing, and Analysis
Seaborn – For Statistical Data Visualization

5. What is Numpy and how it is better than list in python?

NumPy is a Python library used for working with arrays. It also has functions for working in domain of linear algebra, fourier transform, and matrices. It is an open source project and you can use it freely. NumPy stands for Numerical Python.

Advantages of using Numpy Arrays Over Python Lists:

consumes less memory.
fast as compared to the python List.
convenient to use.

6. How to convert List into Tuple in Python?

By passing list object to tuple

7. How can you get list of unique elements from a given list?

By passing list object to set

8. Which python frameworks are used for frontend? What do you know about Flask & Django?

Django is used for frontend.

Flask is a lightweight WSGI web application framework. It is designed to make getting started quick and easy, with the ability to scale up to complex applications. Flask offers suggestions, but doesn't enforce any

dependencies or project layout. It is up to the developer to choose the tools and libraries they want to use. There are many extensions provided by the community that make adding new functionality easy.

Django is a high-level Python Web framework that encourages rapid development and clean, pragmatic design. Built by experienced developers, it takes care of much of the hassle of Web development, so you can focus on writing your app without needing to reinvent the wheel. It's free and open source.

9. How to connect MySQL from Python?

```
import mysql.connector

mydb = mysql.connector.connect(
    host="localhost",
    user="yourusername",
    password="yourpassword"
)

print(mydb)
```

10. How to connect MongoDB from Python?

```
import pymongo

myclient = pymongo.MongoClient("mongodb://localhost:27017/")
```

11. How to handle exceptions in Python?

Try-except-else-finally

In Python, exceptions can be handled using a try statement.

The critical operation which can raise an exception is placed inside the try clause. The code that handles the exceptions is written in the except clause.

12. How to implement abstraction & encapsulation in Python?

To declare an Abstract class, we firstly need to import the abc module. Let us look at an example.

```
from abc import ABC
class abs_class(ABC):
    #abstract methods
```

Here, abs_class is the abstract class inside which abstract methods or any other sort of methods can be defined.

Encapsulation in Python is the process of wrapping up variables and methods into a single entity. In programming, a class is an example that wraps all the variables and methods defined inside it.

In Python, Encapsulation can be achieved using Private and Protected Access Members.

13. How memory is managed in Python?

Methods and variables are created in Stack memory. Objects and instance variables are created in Heap memory. The Python memory manager manages chunks of memory called "Blocks". A collection of blocks of the same size makes up the "Pool". Pools are created on Arenas, chunks of 256kB memory allocated on heap=64 pools. If the objects get destroyed, the memory manager fills this space with a new object of the same size.

14. How to read/write files in Python?

```
# Open the file in Read mode

f=open("file.txt", "r")
contents =f.read()

# Open the file in write mode

f=open("file.txt", "w")
f.write("text")
```

15. Write a one-liner that will count the number of capital letters in a file.

```
with open('file.txt', 'r') as f:
    print (sum(1 for c in f.read() if c.isupper()))
```