100 Essential Python Interview Questions:

1. What is Python? List some popular applications of Python in the world of technology?

Python is a widely-used general-purpose, high-level programming language. It was created by Guido van Rossum in 1991 and further developed by the Python Software Foundation. It was designed with an emphasis on code readability, and its syntax allows programmers to express their concepts in fewer lines of code. It is used for:

- System Scripting
- Web Development
- Game Development
- Software Development
- Complex Mathematics

2. What are the benefits of using Python language as a tool in the present scenario?

Following are the benefits of using Python language:

- Object-Oriented Language
- High Level Language
- Dynamically Typed language
- Extensive support Libraries
- Presence of third-party modules
- Open source and community development
- Portable and Interactive
- Portable across Operating systems

3. Which sorting technique is used by sort() and sorted() functions of python?

Python uses Tim Sort algorithm for sorting. It's a stable sorting whose worst case is O(N log N). It's a hybrid sorting algorithm, derived from merge sort and insertion sort, designed to perform well on many kinds of real-world data.

4. Differentiate between List and Tuple?

Let's analyze the differences between List and Tuple:

List

- Lists are Mutable datatype.
- Lists consume more memory
- The list is better for performing operations, such as insertion and deletion.
- Implication of iterations is Time-consuming

Tuple

- Tuples are Immutable datatype.
- Tuple consume less memory as compared to the list
- Tuple data type is appropriate for accessing the elements
- Implication of iterations is comparatively Faster

5. How memory management is done in Python?

Python uses its private heap space to manage the memory. Basically, all the objects and data structures are stored in the private heap space. Even the programmer can not access this p[rivate space as the interpreter takes care of this space. Python also has an inbuilt garbage collector, which recycles all the unused memory and frees the memory and makes it available to the heap space.

6. What is PEP 8?

PEP 8 is a Python style guide. It is a document that provides the guidelines and best practices on how to write beautiful Python code. It promotes a very readable and eye-pleasing coding style.

7. Is Python a compiled language or an interpreted language?

Actually, Python is a partially compiled language and partially interpreted language. The compilation part is done first when we execute our code and this will generate byte code and internally this byte code gets converted by the python virtual machine(p.v.m) according to the underlying platform(machine+operating system).

8. How to delete a file using Python?

We can delete a file using Python by following approaches:

- os.remove()
- os.unlink()

9. What are Decorators?

Decorators are a very powerful and useful tool in Python as they are the specific change that we make in Python syntax to alter functions easily.

11. What is the difference between Set and Dictionary?

Set is an unordered collection of data type that is iterable, mutable, and has no duplicate elements.
Dictionary in Python is an unordered collection of data values, used to store data values like a map.

12. How do you debug a Python program?

By using this command we can debug a python program:

```
$ python -m pdb python-script.py
```

13. What is Pickling and Unpickling?

Pickle module accepts any Python object and converts it into a string representation and dumps it into a file by using the dump function, this process is called pickling. While the process of retrieving original Python objects from the stored string representation is called unpickling.

14. How are arguments passed by value or by reference in Python?

Everything in Python is an object and all variables hold references to the objects. The reference values are according to the functions; as a result, you cannot change the value of the references. However, you can change the objects if it is mutable.

15. What is List Comprehension? Give an Example.

List comprehension is a syntax construction to ease the creation of a list based on existing iterable.

For Example:

```
my_list = [i for i in range(1, 10)]
```

16. What is Dictionary Comprehension? Give an Example

Dictionary Comprehension is a syntax construction to ease the creation of a dictionary based on the existing iterable.

For Example: *my_dict = {i:1+7 for i in range(1, 10)}*

17. Is Tuple Comprehension? If yes, how and if not why?

```
(i for i in (1, 2, 3))
```

Tuple comprehension is not possible in Python because it will end up in a generator, not a tuple comprehension.

18. What is namespace in Python?

A namespace is a naming system used to make sure that names are unique to avoid naming conflicts.

19. What is a lambda function?

A lambda function is an anonymous function. This function can have any number of parameters but, can have just one statement. For Example:

```
a = lambda x, y : x*y
print(a(7, 19))
```

20. What is a pass in Python?

Pass means performing no operation or in other words, it is a place holder in the compound statement, where there should be a blank left and nothing has to be written there.