What are collections in python

Or

Differences between a List,Set,Tuple,Dict

List	Tuple	Set	Dictionary
A list is a non-homogeneous data structure that stores the elements in columns of a single row or multiple rows.	A Tuple is also a non-homogeneous data structure that stores elements in columns of a single row or multiple rows.	The set data structure is also a non-homogeneous data structure but stores the elements in a single row.	A dictionary is also a non-homogeneous data structure that stores key-value pairs.
The list can be represented by [ ]	Tuple can be represented by ( )	The set can be represented by { }	The dictionary can be represented by { }
The list allows duplicate elements	Tuple allows duplicate elements	The Set will not allow duplicate elements	The dictionary doesn't allow duplicate keys.
The list can use nested among all	Tuple can use nested among all	The set can use nested among all	The dictionary can use nested among all
Example: [1, 2, 3, 4, 5]	Example: (1, 2, 3, 4, 5)	Example: {1, 2, 3, 4, 5}	Example: {1: "a", 2: "b", 3: "c", 4: "d", 5: "e"}

List	Tuple	Set	Dictionary
A list can be created using the **list()** function	Tuple can be created using the **tuple()** function.	A set**A dictionary** can be created using the **set()** function	A dictionary can be created using the **dict()** function.
A list is mutable i.e we can make any changes in the list.	A tuple is immutable i.e we can not make any changes in the tuple.	A set is mutable i.e we can make any changes in the set, ut elements are not duplicated.	A dictionary is mutable, ut Keys are not duplicated.
List is ordered	Tuple is ordered	Set is unordered	Dictionary is ordered (Python 3.7 and above)
Creating an empty list l=[]	Creating an empty Tuple t=()	Creating a set a=set() b=set(a)	Creating an empty dictionary d={}

What are unit tests in Python?

- Unit test is a unit testing framework of Python.
- Unit testing means testing different components of software separately. Can you think about why unit testing is important? Imagine a scenario, you are building software that uses three components namely A, B, and C. Now, suppose your software breaks at a point time. How will you find which component was responsible for breaking the software? Maybe it was component A that failed, which in turn failed component B, and this actually failed the software. There can be many such combinations.
- This is why it is necessary to test each and every component properly so that we know which component might be highly responsible for the failure of the software

What is docstring in Python?

- Documentation string or docstring is a multiline string used to document a specific code segment.
- The docstring should describe what the function or method does

What is slicing in Python?

- As the name suggests, 'slicing' is taking parts of.
- Syntax for slicing is **[start : stop : step]**
- **start** is the starting index from where to slice a list or tuple
- **stop** is the ending index or where to sop.
- **step** is the number of steps to jump.
- Default value for **start** is 0, **stop** is number of items, **step** is 1.
- Slicing can be done on **strings, arrays, lists**, and **tuples**.

What is the difference between Python Arrays and lists?

- Arrays in python can only contain elements of same data types i.e., data type of array should be homogeneous. It is a thin wrapper around C language arrays and consumes far less memory than lists.
- Lists in python can contain elements of different data types i.e., data type of lists can be heterogeneous. It has the disadvantage of consuming large memory.

Define modules in Python?

The module is defined as a file that includes a set of various functions and Python statements that we want to add to our application.

What are Python Decorators?

Decorators are used to add some design patterns to a function without changing its structure. Decorators generally are defined before the function they are enhancing. To apply a decorator we first define the decorator function. **An example for Python Decorator is:**

```
@gfg_decorator
def hi_decorator():
    print("Gfg")
```

Parameters	Python	Java
Code	Python has generally fewer lines of code.	Java has long lines of code.
Framework	Compare to JAVA, Python has a lower number of Frameworks. Popular ones are Django and Flask.	Java has a large number of Frameworks. Popular ones are Spring, Hibernate, etc.
Syntax	The syntax is easy to remember almost similar to human language.	The syntax is complex as it throws errors if you miss semicolons or curly braces.
Key Features	Less line no of code, Rapid deployment, and dynamic typing.	Self-memory management, Robust, Platform independent
Speed	Python is slower since it uses an interpreter and also determines the data type at run time.	Java is faster in speed as compared to python.
Databases	Python's database access layers are weaker than Java's JDBC. This is why it is rarely used in enterprises.	(JDBC)Java Database Connectivity is the most popular and widely used to connect with databases.

How memory management is done in Python?

- In Python memory management is done using private heap space. The private heap is the storage area for all the data structures and objects. The interpreter has access to the private heap and the programmer cannot access this private heap.
- The storage allocation for the data structures and objects in Python is done by the memory manager. The access for some tools is provided by core API for programmers to code.
- The built-in garbage collector in Python is used to recycle all the unused memory so that it can be available for heap storage area.

How do we find bugs and statistical problems in Python?

We can detect bugs in python source code using a static analysis tool named PyChecker. Moreover, there is another tool called PyLint that checks whether the Python modules meet their coding standards or not.

What is the difference between .py and .pyc files?

py files are Python source files. .pyc files are the compiled bytecode files that are generated by the Python compiler

How do you invoke the Python interpreter for interactive use?

By using python or pythonx. y we can invoke a Python interpreter. where x.y is the version of the Python interpreter.

Define String in Python?

String in Python is formed using a sequence of characters. Value once assigned to a string cannot be modified because they are immutable objects. String literals in Python can be declared using double quotes or single quotes.

Example:

```
print("Hi")
print('Hi')
```

What do you understand by the term namespace in Python?

A namespace in Python can be defined as a system that is designed to provide a unique name for every object in python. Types of namespaces that are present in Python are:

1. **Built-in namespace**– These namespaces contain all the built-in objects in python and are available whenever python is running.
2. **Global namespace**– These are namespaces for all the objects created at the level of the main program.
3. **Enclosing namespaces**– These namespaces are at the higher level or outer function.
4. **Local namespaces**– These namespaces are at the local or inner function.

How do you create a Python function?

Functions are defined using the def statement.
An example might be def foo(bar):

Define iterators in Python?

In Python, an iterator can be defined as an object that can be iterated or traversed upon. In another way, it is mainly used to iterate a group of containers, elements, the same as a list.

How does a function return values?

Functions return values using the return statement.

What happens when a function doesn't have a return statement? Is this valid?

Yes, this is valid. The function will then return a None object. The end of a function is defined by the block of code that is executed (i.e., the indenting) not by any explicit keyword.

Define package in Python?

In Python packages are defined as the collection of different modules.

How can we make a Python script executable on Unix?

In order to make a Python script executable on Unix, we need to perform two things. They are:

Script file mode must be executable and

The first line should always begin with #.

Which command is used to delete files in Python?

OS.unlink(filename) or OS.remove(filename) are the commands used to delete files in Python Programming.

Example:

```
import OS
OS.remove("abc.txt")
```

Define pickling and unpickling in Python?

Pickling in Python: The process in which the pickle module accepts various Python objects and converts them into a string representation and dumps the file accordingly using the dump function is called pickling.

Unpickling in Python: The process of retrieving actual Python objects from the stored string representation is called unpickling

Explain the difference between local and global namespaces?

Local namespaces are created within a function when that function is called. Global namespaces are created when the program starts.

What is a boolean in Python?

Boolean is one of the built-in data types in Python, it mainly contains two values, which are true and false.

Python bool() is the method used to convert a value to a boolean value.

```
Syntax for bool() method: bool([a])
```