1. **What is the purpose of the “self” keyword in python?**

   In Python the self keyword is used to refer to the current instance of a class and its method. It is conventional to pass self as the first parameter inside a method of a class as though that we can access its member function. So in class whenever an instance calls a method of a class the first parameter passed is the instance variable itself inside that method.

2. **What is __init__?**

   __init__ is the special method of python which is used to initialise the attributes of an instance of class. It is also known as constructor, unlike other programming languages, there can only be one constructor in a class but there are ways to make it work like multiple constructor. If we don’t give any __init__ method in a class. Then a default __init__ method will be created which won’t initialise any attribute but would only create the object of the said class.

3. **What is the difference between “is” and “==”?**

   In python the “==” and “is” are both used for comparison but in different context. The == operator is used when we wants to compare the value of two different variable (it could be list/tuple/variable/set/dictionary)

   But in the case of the “is” operator it is used to check whether the two variables are referring to the same objects in memory.

4. **How do I use the range function ?**

   The range function in python is used to generate sequence of number. It takes 3 parameter.

   range(start , stop , step)

   It is helpful while using for loop to generate a sequence of number looping wrt that sequence or it could be also be useful to create a list in a quick way.

   X = list(range(1,10,2)

   print(X) # → [1,3,5,7,9]

5. **How do you handle errors and exceptions in python?**

In python we can handle errors and exceptions with the help of try and except block.

Here the try block will enclose (execute) a program that might raise an error. And if an exception is raised it can be handled by the code enclosed by the except block.

Similarly we also have else and finally, with the else being it will execute when no exception is raised and finally being it will execute regardless of whether an exception was raised or not.

6. **What is the difference between "range" and "xrange" ?**

range and xrange were two builtin methods in python 2.

The range function is used to generate a sequence of number and store it in memory. It returns a list containing generated sequence of number.

The xrange function is used to generate a sequence of number on the fly ie. as and when required. It returns a generator object which could be used to generate a sequence as it is needed.

Overall range function should be used when we want to generate small sequence of number and xrange should be used when we want to generate large sequence of number as it is more memory efficient.

In python 3 xrange function has been deprecated and range function has been update to behave like xrange.

7. **What is a namespace and how is it used?**

Namespace is a concept in python which is used to avoid conflict between different variables with the same name in python. So there are 4 namespaces: global namespace, local namespace , class namespace and instance namespace.

It is used to avoid naming conflict and organise our code in a modular fashion. It improves code reusability.

8. **What is a decorator in python and how is it used?**

   In python Decorator is a function that takes another function as input and adds some functionality to it and returns the output. Decorators are ways to modify the behaviour of a function without changing its source code.

9. **What is the purpose of the Static method decorator in python?**

   It is useful if I want to make a function static ie. the method belongs to a class rather than the instance of a variable.

   I can make a function static by using **@staticmethod** above a method in python.

   Static methods can make my code more organised and improve readability and make my code more memory efficient.

10. **What are lists and tuples? What is the key difference between the two?**

    List and tuples both can store heterogeneous data and duplicate value but List are dynamic in nature while tuples are not.

    List has many inbuilt functionality but tuple only has 2 built in methods ie. .index() and .count()

11. **What are global, protected and private attributes in Python?**

Unlike other programming languages python has its own access modifiers which works differently unlike Java and C++ in Python visibility and accessibility of an attribute or method is affected.

In python we have Strong Private represented by __name such type of attributes/method are only accessible inside a class and it's visibility is affected.

Then we have Private represented by _name such type of attributes/method are accessible everywhere but it's visibility is affected.

The we have normal variable or global attributes/methods accessible from anywhere either inside or outside of a class.

Here the major difference is even strong private variables/methods are accessible using mangled name ie. Here the language does not enforce any constraint on any variable/methods, it is upto the developer to decide and make judgement on which variable/method should be accessible upto what level.

12. What are the common built-in data types in Python?

In python there are majorly 8 different type of datatype.

1. Text Type ⇒ str
2. Numeric Type ⇒ int , float , complex
3. Boolean Type ⇒ bool
4. Sequence Type ⇒ list , tuple , range
5. Mapping Type ⇒ dict
6. Set Type ⇒ set
7. Binary Types ⇒ bytes , bytearray , memoryview
8. NoneType ⇒ NoneType

13. What is Scope in Python?

In Python a scope is a region where a particular variable has been defined and can be accessed. There are 4 scopes in python: Local Scope , Enclosing Scope , Global Scope, Built-in scope. Whenever a variable is accessed python follows LEGB rule and if it does not find any variable then a name error is raised.

14. What is break, continue and pass in Python?

break, continue , pass are keywords in python used inside a function as per the developer requirement.

break is used when I want to break out of a for or while loop in python.

continue is used when I want to skip the current iteration and jump to next iteration

pass is used when I want to define a function without any logical execution plan, it is helpful while debugging or just creating the structure of a program.

15. What is slicing in Python?

Slicing is a way in python to extract part of a sequence, it could be list , tuple , string. To use slicing we use square brackets and specify the start , stop and an optional step index. It is often used with loops and methods to achieve a programming goal.