Python interview questions

What is the difference between list and tuple?

List	Tuple
1. List is created by using [ ] symbol. 2. List elements are mutable	1. Tuple is created by using ( ) symbol. 2. Tuple elements are immutable

eg:

a = [10,20,30] b = (100,200,300)

What is set?

Set is created by using { } symbol.

Set stores elements in random order fashion.

Set doesn't allow duplicate elements.

eg: c = {'palle', 'python', 'bangalore'}

What is a dictionary?

dictionary is used to store key-value pairs.

Keys should be unique, and values can be duplicate.

eg:

```
d = {
    ‘email’ : ‘enquiry@techpalle.com’,
    ‘pw’ : ‘abcd123’,
    ‘course’ : ‘python’,
    ‘duration’ : 90
}
```

How will you create array in python?

we can create array in python by importing array module.

eg:

```
Import array
e = array.array( 'i' , [10,20,30,40] )
print(e)
```

What is the difference between array and list?

array	list
In array we can store only homogeneous elements.	In list we can store homogeneous and heterogeneous elements.

What is the difference between list and dictionary?

list	dictionary
List is an ordered collection of elements, where the elements are stored on index basis.	Dictionary is used to store pairs of elements
We can access list elements using index.	We can access dictionary values with keys.

Note : same difference can be told for tuple vs dictionary also.

What is the difference between list and set?

list	set
List is an ordered collection of elements, where the elements are stored on index basis.	Set elements are stored in random order.
We can access list elements using index.	We can't access set elements using index.
List allows duplicate elements.	Set doesn't allow duplicate elements.

Note : same difference can be told for tuple vs set also.

What is list comprehension?

list comprehension is a concise way to create a new list from values of existing list.

eg:

```
f = [10,20,30]
g = [item*2  for  item in f]
print(g)
```

What is default parameter?

A function parameter can have a default value. If the function is called without passing value to that parameter, then that parameter will get that default value.

eg:

```
def m1(x,y,z=10):
    print(x,y,z)

m1(1,2)
```

In the given example z is default parameter.

what is args?

arguments is represented with single *

by using *args programmer can pass variable number of arguments to a function.

eg:

```
def m2(*x):
    print(x)

m2(100,200,300)
```

what is kwargs (key word arguments) ?

keyword arguments is represented with **

by using **kwargs programmer can pass variable number of key worded arguments (or pairs of elements)

eg:

```
def  m3(**x):
    print(x)

m3(name='palle', course='python', duration=90)
```

What is the difference between args and kwargs?

args	kwargs
arguments is represented with single * symbol before the parameter.	Keyword arguments is represented with ** symbol before the parameter.
by using args programmer can pass variable number of arguments to a function.	by using kwargs programmer can pass variable number of key worded arguments (or pairs of elements) to a function

What is lambda or lambda expression?

lambda expression is an un-named function which contains single expression code

lambda expressions are used for passing a call back function as parameter.

eg:

```
m4 = lambda x, y : x + y
print(  m4(10,20)  )
```

What is a generator?

Generator is used create an iterator (of values) which we can iterate and read elements one by one using a loop.

What is a regex or regular expression?

1. regular experession is a string pattern that we want to find in a given text.
2. re is a predefined module in python which contains regular expression functions.

eg:

```
import re
re.search('all' , 'palle')
```

search() function is used to search the first occurrence of a word in the given text.

what is the use of split() function?

1. by using split function we can split a string into words and store into a list.
2. split() function expects a separator as parameter, based on which you can split the string.

eg:

```
h = 'palle technologies python bangalore'
mylist = h.split(' ')
print(mylist)
```

it will display output as ['palle' , 'technologies' , 'python' , 'bangalore']

what is the use of join() function?

by using join function we can join the list of elements into a string.

eg:

```
j = [‘palle’, ‘technologies’, ‘python’, ‘bangalore’]
k = ‘ ‘.join(j)
print(k)
```

it will display output as palle technologies python bangalore.

What is decorator?

decorator is used to modify the behavior of a function,
without explicitly changing it's structure.

eg:

```
def  wrapper(fun):
    def inner():
            print('hello')
            fun()
            print('bye')
    return inner

@wrapper
def display():
    print('display function')
```

In the above code wrapper
is the decorator for display() function

If we call display() function then output will be
Hello
Display function
bye

What is Object oriented programming language?

- Any Programming language which supports below 6 features is considered as OOP language

1. **Class**
2. **Object**
3. **Encapsulation**
4. **Abstraction**
5. **Inheritance**
6. **Polymorphism**

What is a class

class is a virtual entity.

class acts as blue print for objects.

class is used for storing related variables and methods.

eg:

```
class  Student:
        def study(self):
            print('student is studying')
```

What is an object

Object is a real world entity.

eg:

```
s1  = Student()
```

what is constructor or init() ?

by using constructor we can assign data into objects or we can initialize objects

eg:

```
class Bank:
    def __init__(self, name, acno):
        self.name = name
        self.acno = acno

b1 = Bank('ramesh', 12345)
```

What is encapsulation?

binding logically related data and functions in a common related place, is known as encapsulation.

eg:

```
class Doctor:
    def __init__(self, name, exp):
        self.name = name
        self.exp = exp
    def suggestMedicine(self):
        print('doctor will suggest medicine to patient')
```

In the above example, we are storing all the doctor related data and doctor related methods in one class. So we can say Doctor class is following encapsulation.

What is inheritance?

inheritance allows us to access parent class variables and methods, in child class.

Inheritance reduces code duplication.

eg:

```
class Bank:
      def addaccount(self):
         pass                    #contains code for adding new account in the bank
class HdfcBank(Bank):
     def  rateofinterest(self):
         pass                    #contains code for calculating rate of interest
```

What is method overriding?

1. having same method name in parent class and child class, with same number of parameters, is known as method overriding.
2. overriding is used for changing the behavior of parent class method in the child class.

eg:

```
class Animal:
    def run(self):
        print('animal runs on 4 legs')

class Human(Animal):
    def run(self):
        print('human runs on 2 legs')
```

What is polymorphism?

1. when an entity is appearing with the **same name** in **different forms,** then that entity is said to exhibit **polymorphism**
2. method over riding is an example of polymorphism.

Does python support method overloading?

No

Can we achieve method overloading in python?

Yes, by using * parameter we can achieve method overloading indirectly

what is the use of self keyword

1. **self** keyword refers to current instance or current object.
2. by using self keyword we can create and access instance variables

```
class Doctor:
        def __init__(self,name,exp):
            self.name = name
            self.exp = exp
```

what is the use of super() function

by using super() function we can access parent class methods from child class.

```
class A:
        def m5(self):
            print('hello')

class B(A):
        def m6(self):
            super().m5()
```

What is class variable?

1. If we declare a variable at class level, then it is considered as a class variable.
2. we can use class name to access class variables.

```
class C:
        x = 10
        def display(self):
            print('hello')

print(C.x)
```

What is the dif between instance variable and class variable?

Instance variable	Class variable
Instance variables are object specific	class variables are class specific
instance variables are declared with self keyword as prefix.	class variables are declared at the class level, without self keyword.
for accessing instance variables we need to use object.	for accessing class variables we can use class name.

```
class D:
        x = 10
        def __init__(self):
            self.y = 20

d1 = D()
print(d1.y)
print(D.x)
```

What is the dif between instance method and class method?

Instance method	Class method
instance methods will have self parameter by default.	Class methods will have cls parameter by default. Class method should be marked with @classmethod decorator above the method name.
For calling instance methods we need to use object.	For calling class methods we can use class name.

```
class E:
    def m7(self):
        print('instance method')

    @classmethod
    def m8(cls):
        print('class method')
```

```
e1 = E()
e1.m7()
E.m8()
```

What is dif between static method and class method?

Static method	Class method
If we use @staticmethod decorator above a method name, then that method is considered as static method.	If we use @classmethod decorator above a method name, then that method is considered as static method.
for calling static methods we can use class name.	For calling class methods we can use class name.
Static methods will not have any parameters by default.	Class methods will have cls parameter by default.

```
class F:
    @classmethod
    def m9(cls):
        print('class method')
    @staticmethod
    def m10():
        print('static method')
```

What is the parent most class for all classes?

object class

How will you access, members of other modules?

By using import keyword we can import one module into other module and access its members.

What all the access specifiers supported in python?

1. Python explicitly doesn't have any access specifiers.
2. But we can prefix a variable with 2 underscores or 1 underscore to mark it as private or protected respectively.

How will you create public variable in python?

1. public keyword is not available in python.
2. by default all the variables, methods, and classes are considered public in python, which we can access from any where.

How will you create private variable in python?

1. If we use 2 underscores before a variable or method, then it is considered as private member of that class.
2. we can access that member only with in the same class.

```
class G:
        def __init__(self):
            self.__x = 10                  #private variable x
        def m11(self):
            print(self.__x)                #we can access same class

g1 = G()
print(g1.__x)     #error we can't access private variable outside class
```

How will you create protected variable in python?

1. If we use 1 underscore before a variable or method, then it is considered as protected member.
2. Protected members can be accessible only with in the same class, as well as in the child class.

eg: _y = 20 #here y is considered as protected

How to create a default variable in python?

It is not possible.

What is an abstract method

1. by specifying @abstractmethod decorator above the method name, we can mark a method as abstract method.
2. generally abstract methods will not have method bodies.

eg:

```
@abstractmethod
def fun(self):
   pass
```

what is an abstract class?

1. if a class contains **one or more** abstract methods then it is called as abstract class.
2. an abstract class must inherit from predefined class **ABC**.
3. we can't create object for an abstract class.

eg:

```
from abc import ABC

class  H(ABC):
   @abstractmethod
    def f1(self):
            pass
```

when to use abstract method?

If you know only method name but you don't know the logic, then we make that method as abstract method.

can we create object for an abstract class?

no

how do you use an abstract class?

we use an abstract class by inheriting into another class, and by over riding all abstract methods of parent class in the child class.

does python support multiple inheritance of classes?

yes

what is is ABC?

1. ABC stands for abstract base class.
2. ABC is a predefined class of python. we need to inherit from ABC class, to mark a class as an abstract class.

what is abc?

1. It is a predefined module in python which contains ABC class.
2. we need to import abc module to use ABC class.

What is abstraction?

hiding implementation details and exposing the required details to the user, is known as abstraction.

eg :

mobile phone is an example for abstraction.

because we don’t know the internal working mechanism of mobile phone.

what is an exception?

exception is a run time error which terminates the program abruptly.

how do you handle exceptions?

we will handle exceptions by using try-except blocks

```
try:
        #code that gives error
except errorname:
        #error storing code
```

Can we have multiple except blocks for one try block?

Yes, one try block can be followed by multiple catch blocks.

What is finally block?

1. finally block code will be executed in all the scenarios no matter whether exception occur or does not occur.
2. finally block is used to clean important system resources , like closing files, closing database connections etc.

One try block can have how many finally blocks?

one try block can have maximum one finally block

Is it possible to have a try block without except block?

yes we can have try without except block, in case if finally block is available.

write one example for exception handling?

```
try:
        x = [10,20,30]
        print(x[3])
except IndexError:
        print('trying to access invalid position')
```