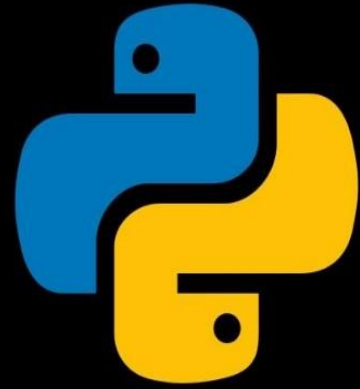# PYTHON

Top 150 Python Interview Questions & Answers

1. What is the Difference Between a Shallow Copy and aDeep Copy?

All is applied in Nested list only

Deepcopycreatesadifferentobjectandpopulatesitwiththechildobjectsoftheoriginalobject.Therefore, changes inthe original objectare not reflectedin the copy.

Shalow Copy- Original will be changed once copied is modified.

copy.deepcopy()createsaDeepCopy.

Deep Copy - Original will not be change once copied is modified.

Ashallowcopycreatesadifferentobjectandpopulatesitwiththereferencesofthechildobjectswithintheo riginalobject.Therefore,changes intheoriginalobjectare reflectedinthecopy.

copy.copycreatesaShallowCopy.

2. How Is Multithreading Achieved in Python?

Multithreadingusuallyimpliesthatmultiplethreadsareexecutedconcurrently.ThePythonGlobalInterpr eter Lock doesn't allow more than one thread to hold the Python interpreter at thatparticular point of time. So, multithreading in Python is achieved through context switching. It isquitedifferent frommultiprocessing which opensup multiple processesacross multiplethreads.

3. Discuss Django Architecture.

HereyoucanalsofindacomprehensiveguideonPythonDjangoTutorialthatisveryeasyto understand.

Django is a web service used to build your web pages. Its architecture is as shown:

- Template:thefrontendofthewebpage
- Model:thebackendwherethedataisstored
- View:ItinteractswiththemodelandtemplateandmapsittotheURL
- Django:servesthepagetotheuser

4.　What Advantage Does the Numpy Array Have over aNested List?

Numpy is written in C so that all its complexities are backed into a simple-to-use module. Lists, onthe other hand, are dynamically typed. Therefore, Python must check the data type of eachelement every time it uses it. This makes Numpy arrays much faster than lists.

Numpyhasalotofadditionalfunctionalitythatthelistdoesn'toffer;forinstance,alotofthingscanbe automated in Numpy.

5. What are Pickling and Unpickling?

Pickling	Unpickling
• ConvertingaPythonobjecthierarchytoabyt estreamiscalledpickling • Picklingisalsoreferredtoasserialization	• ConvertingabytestreamtoaPythonobjecthier archyiscalledunpickling • Unpicklingisalsoreferredtoasde serialization

If you just created a neural network model, you can save that model to your hard drive, pickleit, and then unpickle it to bring it back into another software program or use it at a later time.

The following are some of the most frequently asked Python interview questions

6. How is Memory managed in Python?

Python has a private heap space that stores all the objects. The Python memory managerregulates various aspects of this heap, such as sharing, caching, segmentation, andallocation. The user has no control over the heap; only the Python interpreter has access.

7. AreArgumentsinPythonPassedbyValueorbyReference?

Arguments are passed in Python by a reference. This means that any changes made withina function are reflected in the original object.

Consider two sets of code shown below:
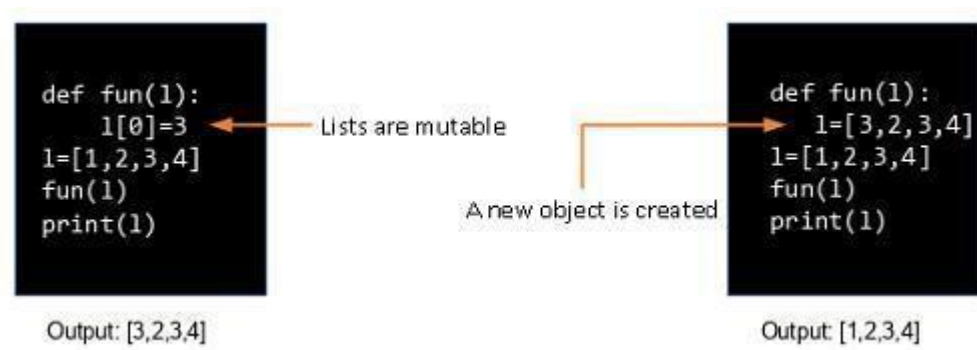
In the first example, we only assigned a value to one element of 'l', so the output is [3, 2, 3, 4].

In the second example, we have created a whole new object for 'l'. But, the values [3, 2, 3, 4]don't show up in the output as it is outside the definition of the function.

8. HowWouldYouGenerateRandomNumbersinPython?

TogeneraterandomnumbersinPython,youmustfirstimporttherandommodule.The

random() function generates a random float value between 0 & 1.

> random.random()

The randrange() function generates a random number within a given

range.Syntax: randrange(beginning, end, step)

Example - > random.randrange(1,10,2)

9. What Does the // Operator Do?

In Python, the / operator performs division and returns the quotient in the

float.For example: 5 / 2 returns 2.5

The//operator,ontheotherhand,returnsthequotientinaninteger.For

example: 5 // 2 returns 2

10. What Does the 'is' Operator Do?

The 'is' operator compares the id of the two

objects.list1 = [1,2,3]

list2 =

[1,2,3]list3 =

list1

list1==list2=>Trueis

t1   is   list2   =>

Falselist1islist3=>Tr

ue

11. What Is the Purpose of the Pass Statement?

The pass statement is used when there's a syntactic but not an operational requirement.
Forexample - The program below prints a string ignoring the spaces.

var="Si mplilea

rn"for i in var:

  if i==" ":

    pass

  else:

    print(i,end="")

Here,thepassstatementrefersto'noactionrequired.'

12. HowWillYouCheckIfAlltheCharactersinaStringAre Alphanumeric?

Python has an inbuilt method isalnum() which returns true if all characters in the string arealphanumeric.

Example -

>>

       "abcd123".isaln

um()Output:True

>>"abcd@123#".isalnum()

Output: False

Another way is to use regex as shown.

>>import re

>>bool(re.match('[A-Za-z0-

9]+$','abcd123'))Output:True

>> bool(re.match('[A-Za-z0-

9]+$','abcd@123'))Output: False

13. HowWillYouMergeElementsinaSequence?

There are three types of sequences in Python:

- Lists
- Tuples
- Strings

ExampleofLists-

\>\>l1=[1,2,3]

\>\>l2=[4,5,6]

\>\>l1+l2

Output: [1,2,3,4,5,6]

ExampleofTuples-

\>\>t1=(1,2,3)

\>\>t2=(4,5,6)

\>\>t1+t2

Output: (1,2,3,4,5,6)

Example of String -

\>\>s1="Simpli"

\>\>s2="learn"

\>\>s1+s2

Output: 'Simplilearn'

14. HowWouldYouRemoveAllLeadingWhitespaceinaString?

Python provides the inbuilt function lstrip() to remove all leading spaces from a string.

\>\>"   Python".lstrip

Output:Python

15. HowWouldYouReplaceAllOccurrencesofaSubstringwith a New String?

The replace() function can be used with strings for replacing a substring with a given string.Syntax:

str.replace(old,new,count)

replace() returns a new string without modifying the original

string.Example -

>>"Hey John. How are you,

John?".replace("john","John",1)Output: "Hey John. How are

you, John?

16. WhatIstheDifferenceBetweenDelandRemove()onLists?

del	remove()
• delremovesallelementsofalistwithinagivenrange • Syntax:dellist[start:end]	• remove()removesthefirstoccurrenceofaparticularcharacter • Syntax:list.remove(element)

Here is an example to understand the two statements -

>>lis=['a', 'b', 'c', 'd']

>>del lis[1:3]

>>lis

Output: ["a","d"]

>>lis=['a','b','b','d']

>>lis.remove('b')

>>lis

Output: ['a', 'b', 'd']

Note that in the range 1:3, the elements are counted up to 2 and not 3.

17. HowDoYouDisplaytheContentsofaTextFileinReverse Order?

Youcandisplaythecontentsofatextfileinreverseorderusingthefollowingsteps:

- Openthefileusingtheopen()function

- Storethecontentsofthefileinalist

- Reversethecontentsofthelist

- Runaforlooptoiteratethroughthelist

18. Differentiate Between append() and extend().

append()	extend()

- append()addsanelementtotheendofthelist
- Example-
 	
    >>lst=[1,2,3]
 	
    >>lst.append(4)
 	
    >>lst
 	
Output:[1,2,3,4]
	
	- extend()addselementsfromaniterabletotheendofthelist
	- Example-
	
	    >>lst=[1,2,3]
	
	>>lst.extend([4,5,6])
	
	>>lst

Output:[1,2,3,4,5,6]

19. WhatIstheOutputofthebelowCode?JustifyYourAnswer.

```
>>defaddToList(val,list=[]):

>>list.append(val)

>>returnlist

>>list1=addToList(1)

>>list2=addToList(123,[])

>>list3=addToList('a')

>>print ("list1 = %s" % list1)

>>print ("list2 = %s" % list2)

>>print ("list3 = %s" %

list3)Output:

list1 =

[1,'a']list2 =

[123]lilst3=[

1,'a']
```

Notethatlist1andlist3areequal.WhenwepassedtheinformationtotheaddToList,wediditwithout a second value. If we don't have an empty list as the second value, it will start with anempty list, which we then append. For list2, we appended the value to an empty list, so itsvalue becomes [123].

For list3, we're adding 'a' to the list. Because we didn't designate the list, it is a shared value.It means the list doesn't reset and we get its value as [1, 'a'].

Remember that a default list is created only once during the function and not during its callnumber.

20. WhatIstheDifferenceBetweenaListandaTuple?

Lists are mutable while tuples are

immutable.Example:

List

>>lst = [1,2,3]

>>lst[2] = 4

>>lstOutput:[

1,2,4]Tuple

>>tpl = (1,2,3)

>>tpl[2] = 4

>>tpl

Output:TypeError:'tuple'

the object does not support item assignment

Thereisanerrorbecauseyoucan'tchangethetuple123into124.Youhavetocompletely reassign the tuple to a new value.

21. What Is Docstring in Python?

This is one of the most frequently asked Python interview questions

Docstrings are used in providing documentation to various Python modules, classes, functions,and methods.

Example-

```
def add(a,b):

" " "This function adds two numbers." "

"sum=a+b

return

sumsum=add(1

0,20)

print("Accessing docstring method 1:",add.__doc

_____)print("

Accessing docstring method 2:",end="")help(add)
```

Output -

Accessing docstring method 1: This function adds two

numbers.Accessing docstring method 2: Help on function add-in module

_____main

_____:add(a,

b)

This function adds two numbers.

22. HowDoYouUsePrint()WithouttheNewline?

The solution to this depends on the Python version you are

using.Python v2

>>print("Hi. "),

>>print("How are

you?")Output: Hi. How

are you?Pythonv3

>>print("Hi",end=" ")

>>print("How are

you?")Output:Hi.Howare

you?

23. HowDoYouUsetheSplit()FunctioninPython?

Thesplit()functionsplitsastringintoseveralstringsbasedonaspecificdelimiter.Syntax

-

string.split(delimiter,

max)Where:

the delimiter is the character based on which the string is split. By default it is

space.max is the maximum number of splits

Example -

>>var="Red,Blue,Green,Orange"

>>lst=var.split(",",2)

>>print(lst)

Output:

['Red','Blue','Green, Orange']

Here, we have a variable var whose values are to be split with commas. Note that '2' indicatesthat only the first two values will be split.

24. Is Python Object-oriented or Functional Programming?

Pythonisconsideredamulti-paradigmlanguage.

Python follows the object-oriented paradigm

- Pythonallowsthecreationofobjectsandtheirmanipulationthroughspecificmethods

- ItsupportsmostofthefeaturesofOOPSsuchasinheritanceandpolymorphism

Python follows the functional programming paradigm

- Functionsmaybeusedasthefirst-classobject

- PythonsupportsLambdafunctionswhicharecharacteristicofthefunctionalparadigm

25. WriteaFunctionPrototypeThatTakesaVariableNumber of Arguments.

The function prototype is as follows:

def function_name(*list)

>>def fun(*var):

>>   for i

invar:print(i)

>>fun(1)

>>fun(1,25,6)

In the above code, * indicates that there are multiple arguments of a variable.

26. What Are *args and *kwargs?

*args

- Itisusedinafunctionprototypetoacceptavaryingnumberofarguments.

- It'saniterableobject.

- Usage-deffun(*args)

*kwargs

- Itisusedinafunctionprototypetoacceptthevaryingnumberofkeywordedarguments.

- It'saniterableobject

- Usage-deffun(**kwargs):

fun(colour="red".units=2)

27. "In Python, Functions Are First-class Objects." WhatDoYou Inferfrom This?

Itmeansthatafunctioncanbetreatedjustlikeanobject.Youcanassignthemtovariables,orpassthema
sargumentstootherfunctions.Youcanevenreturnthemfromotherfunctions.

28. What Is the Output Of: Print(__name__)?JustifyYourAnswer.

name_____is a special variable that holds the name of the current module. Program execution
startsfromthemainorcodewith0indentations.Thus,name_____hasavaluemain_____in the above
case.Ifthefileisimportedfromanothermodule,name_____holdsthenameofthismodule.

29. What Is a Numpy Array?

Anumpyarrayisagridofvalues,allofthesametype,andisindexedby a tuple ofnon-negative integers.
The number of dimensions determines the rank of the array. The shapeof an array is a tuple of
integers giving the size of the array along each dimension.

30. What Is the Difference Between Matrices and Arrays?

Matrices	Arrays
• Amatrixcomesfromlinearalgebraandisatwo-dimensionalrepresentationofdata • It comes with a powerful set of mathematicaloperationsthatallowyoutomanipulatethe	• Anarrayisasequenceofobjectsofsimilardatatype • Anarraywithinanotherarrayforms amatrix

31. HowDoYouGetIndicesofNMaximumValuesinaNumpy Array?

>>import numpy as np

>>arr=np.array([1, 3, 2, 4, 5])

>>print(arr.argsort()[-N:][::-1])

32. HowWouldYouObtaintheRes_setfromtheTrain_setandtheTest_setfromBelow?

>>train_set=np.array([1, 2, 3])

>>test_set=np.array([[0, 1, 2], [1, 2, 3])

Res_set[[1,2,3],[0,1,2],[1,2,3]]

Choose the correct option:

1. res_set=train_set.append(test_set)

2. res_set=np.concatenate([train_set,test_set]))

3. resulting_set=np.vstack([train_set,test_set])

4. Noneofthese

Here, options a and b would both do horizontal stacking, but we want vertical stacking. So, optionc is the right statement.

resulting_set = np.vstack([train_set, test_set])

33. HowWouldYouImportaDecisionTreeClassifierinSklearn? Choose the Correct Option.

1. fromsklearn.decision_treeimportDecisionTreeClassifier

2. fromsklearn.ensembleimportDecisionTreeClassifier

3. fromsklearn.treeimportDecisionTreeClassifier

4. Noneofthese

Answer-3.fromsklearn.treeimportDecisionTreeClassifier

34. You Have Uploaded the Dataset in csv Format onGoogleSpreadsheetandSharedItPublicly.HowCanYouA ccess This in Python?

Wecanusethefollowingcode:

>>link = https://docs.google.com/spreadsheets/d/...

>>source = StringIO.StringIO(requests.get(link).content))

>>data = pd.read_csv(source)

35. WhatIstheDifferenceBetweentheTwoDataSeriesGiv en Below?

df['Name'] and df.loc[:, 'Name'], where:

df = pd.DataFrame(['aa', 'bb', 'xx', 'uu'], [21, 16, 50, 33], columns = ['Name',

'Age'])Choose the correct option:

1. 1istheviewoftheoriginaldataframeand2isacopyoforiginaldataframe

2. 2istheviewoftheoriginaldataframeand1isacopyoforiginaldataframe

3. Botharecopiesoforiginaldataframe

4. Bothareviewsoforiginaldataframe

Answer - 3. Both are copies of the original dataframe.

36. YouGettheError"temp.Csv"WhileTryingtoReadaFileUsin g Pandas. Which of the Following Could Correct It?

Error:

Traceback(mostrecentcalllast):File"<input>",line1,in<module>UnicodeEncodeError:

'ascii'codeccan'tencodeacharacter.Ch

oose the correct option:

1. pd.read_csv("temp.csv",compression='gzip')

2. pd.read_csv("temp.csv",dialect='str')

3. pd.read_csv("temp.csv",encoding='utf-8)

4. Noneofthese

Theerrorrelatestothedifferencebetweenutf-

8codingandUnicode.Sooption3.pd.read_csv("temp.csv",encoding='utf-

8')cancorrectit.

37. HowDoYouSetaLineWidthinthePlotGivenBelow?
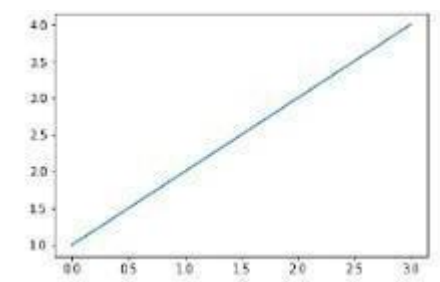
>>import matplotlib.pyplot as plt

>>plt.plot([1,2,3,4])

>>plt.show()

Choose the correct option:

1. Inlinetwo,writeplt.plot([1,2,3,4],width=3)

2. Inlinetwo,writeplt.plot([1,2,3,4],line_width=3

3. Inlinetwo,writeplt.plot([1,2,3,4],lw=3)

4. Noneofthese

Answer - 3. In line two, write plt.plot([1,2,3,4], lw=3)

38. HowWouldYouResettheIndexofaDataframetoaGiven List? Choose the Correct Option.

1. df.reset_index(new_index,)

2. df.reindex(new_index,)

3. df.reindex_like(new_index,)

4. Noneofthese

Answer - 3. df.reindex_like(new_index,)

39. HowCanYouCopyObjectsinPython?

The function used to copy objects in Python are:

copy.copyforshallowcopyandco

py.deepcopy()fordeepcopy

40. What Is the Difference Between range() andxrange() Functions in Python?

range()	xrange()
• rangereturnsaPythonlistobject	• xrange returns an xrange object

41. HowCanYouCheckWhetheraPandasDataframeIsEmpty or Not?

The attribute df.empty is used to check whether a pandas data frame is empty or not.

```
>> import pandas as pd
```

```
>>df=pd.DataFrame({A:[]})
```

```
>>df.empty
```

Output:True

42. WriteaCodetoSortanArrayinNumpybythe(N-1)th Column.

This can be achieved by using argsort() function. Let us take an array X; the code to sort the(n-1)th column will be x[x [: n-2].argsoft()]

The code is as shown below:

```
>>import numpy as np
```

```
>>X=np.array([[1,2,3],[0,5,2],[2,3,4]])
```

```
>>X[X[:,1].argsort()]Output:array([[
```

1,2,3],[0,5,2],[2,3,4]])

43. HowDoYouCreateaSeriesfromaList,NumpyArray,andDictionary?

The code is as shown:

```
>> #Input
```

```
>>import numpy as np
```

```
>>import pandas as pd
```

```
>>mylist = list('abcedfghijklmnopqrstuvwxyz')
```

```
>>myarr = np.arange(26)
```

```
>>mydict = dict(zip(mylist, myarr))
```

```
>> #Solution

>>ser1 = pd.Series(mylist)

>>ser2 = pd.Series(myarr)

>>ser3 = pd.Series(mydict)

>>print(ser3.head())
```

44. HowDoYouGettheItemsNotCommontoBothSeriesA and Series B?

```
>> #Input

>>import pandas as pd

>>ser1 = pd.Series([1, 2, 3, 4, 5])

>>ser2 = pd.Series([4, 5, 6, 7, 8])

>> #Solution

>>ser_u = pd.Series(np.union1d(ser1, ser2)) # union

>>ser_i = pd.Series(np.intersect1d(ser1, ser2)) # intersect

>>ser_u[~ser_u.isin(ser_i)]
```

45. HowDoYouKeepOnlytheTopTwoMostFrequentValuesasItIsandReplaceEverythingElseas'other'inaSeries?

```
>> #Input

>>import pandas as pd

>>np.random.RandomState(100)
```

```
>>ser = pd.Series(np.random.randint(1, 5, [12]))
```

```
>> #Solution
```

```
>>print("Top2Freq:",ser.value_counts())
```

```
>>ser[~ser.isin(ser.value_counts().index[:2])]='Other'
```

```
>>ser
```

46. HowDoYouFindthePositionsofNumbersThatAre Multiples of Three from a Series?

```
>> #Input
```

```
>>import pandas as pd
```

```
>>ser = pd.Series(np.random.randint(1, 10, 7))
```

```
>>ser
```

```
>>#Solution
```

```
>>print(ser)
```

```
>>np.argwhere(ser%3==0)
```

47. HowDoYouComputetheEuclideanDistanceBetweenTw oSeries?

The code is as shown:

```
>> #Input
```

```
>>p = pd.Series([1, 2, 3, 4, 5, 6, 7, 8, 9, 10])
```

```
>>q = pd.Series([10, 9, 8, 7, 6, 5, 4, 3, 2, 1])
```

```
>>      #Solution

>>sum((p - q)**2)**.5

>>      #Solution

usingfunc

>>np.linalg.norm(p-q)
```

YoucanseethattheEuclideandistancecanbecalculatedusingtwoways.

48. HowDoYouReversetheRowsofaDataFrame?

```
>> #Input

>>df = pd.DataFrame(np.arange(25).reshape(5, -1))

>>      #Solutio

n>>df.iloc[::-1,

:]
```

49. IfYouSplitYourDataintoTrain/TestSplits,IsItPossibletooverFit YourModel?

Yes.Onecommonbeginnermistakeisre-tuningamodelortrainingnewmodelswithdifferentparameters after seeing its performance on the test set.

50. WhichPythonLibraryIsBuiltonTopofMatplotliband Pandas to Ease Data Plotting?

Seaborn is a Python library built on top of matplotlib and pandas to ease data plotting. It is a datavisualization library in Python that provides a high-level interface for drawing statisticalinformative graphs.

51. What are the important features of Python?

- Python is a scripting language. Python, unlike other programming languages like Cand its derivatives, does not require compilation before execution.

- Python is dynamically typed, which means you don't have to specify the kindsof variables when declaring them or anything.

- Python is well suited to object-oriented programming since it supports class definition,composition, and inheritance.

52. What type of language is Python?

Although Python can be used to write scripts, it is primarily used as ageneral-purpose programming language.

53. Explain how Python is an interpreted language.

Any programming language that is not in machine-level code before runtime is called aninterpreted language. Python is thus an interpreted language.

54. What is PEP 8?

PEP denotes Python Enhancement Proposal. It's a collection of guidelines for formatting Pythoncodefor maximum readability.

55. Explain the Python namespace.

In Python, a namespace refers to the name that is assigned to each object.

56. What are decorators in Python?

Decorators are used for changing the appearance of a function without changing its structure.Decorators are typically defined before the function they are enhancing.

57. How to use decorators in Python?

Decorators are typically defined before the function they are enhancing. To use a decorator, wemust first specify its function. Then we write the function to which it is applied, simply placing thedecorator function above the function to which it must be applied.

58. Differentiate between .pyc and .py.

The .py files are the source code files for Python. The byte code of the Python files is stored in .pyc files, which are created when code is imported from another source. The interpreter saves time by converting the source .py files to .pyc files.

59. What is slicing in Python?

Slicing is a technique for gaining access to specific bits of sequences such as strings, tuples, and lists.

60. How to use the slicing operator in Python?

Slicing is a technique for gaining access to specific bits of sequences such as lists, tuples, and strings. The slicing syntax is [start:end:step]. This step can also be skipped. [start:end] returns all sequence items from the start (inclusive) to the end-1 element. It means the ith element from the end of the start or end element is negative i. The step represents the jump or the number of components that must be skipped.

61. What are keywords in Python?

In Python, keywords are reserved words with a specific meaning. They are commonly used to specify the type of variables. Variable and function names cannot contain keywords. Following are the 33 keywords of Python:

- Yield
- For
- Else
- Elif
- If
- Not
- Or
- And
- Raise

- Nonlocal

- None

- Is

- In

- Import

- Global

- From

- Finally

- Except

- Del

- Continue

- Class

- Assert

- With

- Try

- False

- True

- Return

- Pass

- Lambda

- Def

- As

- Break

- While

62. How to combine dataframes in Pandas?

This is one of the most commonly asked Python interview questions

The following are the ways through which the data frames in Pandas can be combined:

- Concatenatingthembyverticallystackingthetwodataframes.
- Concatenatingthembyhorizontallystackingthetwodataframes.
- Puttingthemtogetherinasinglecolumn.

63. What are the key features of the Python 3.9.0.0 version?

- Zoneinfo and graphlib are two new modules.
- Improved modules such as asyncio and ast.
- Optimizationsincludeimprovedidiomforassignment,signalhandling,andPythonbuilt-ins.
- Removal of erroneous methods and functions.
- Instead of LL1, a new parser is based on PEG.
- RemovePrefixesand SuffixeswithNew StringMethods.
- Generics with type hinting in standard collections.

64. In Python, how is memory managed?

- Python's private heap space is in charge of memory management. A private heapholds all Python objects and data structures. This secret heap is not accessible to theprogrammer.Instead, the Pythoninterpreter takes careof it.
- Pythonalsoincludesabuilt-ingarbagecollector,whichrecyclesallunusedmemoryand makes it available to the heap space.
- Python's memory management is in charge of allocating heap space for Python objects.The core API allows programmers access to some programming tools.

65. ExplainPYTHONPATH.

It's an environment variable that is used when you import a module. When a module is imported,PYTHONPATHischeckedtoseeiftheimported modules are present in various folders. It isused by the interpreter to determine which module to load.

66. Explain global variables and local variables in Python.

LocalVariables:Alocalvariableisanyvariabledeclaredwithinafunction.Thisvariableexistsonly in local space, not in global space.

GlobalVariables:Globalvariablesarevariablesdeclaredoutsideofafunctionorinaglobalspace.

Any function in the program can access these variables.

67. Is Python case-sensitive?

Yes,Pythoniscase-sensitive.

68. HowtoinstallPythononWindowsandsetpathvariables?

- DownloadPythonfromhttps://www.python.org/downloads/

- Installitonyourcomputer.Usingyourcommandprompt,lookforthelocationwherePYTHONisinstalled onyourcomputerbytypingcmdpython.

- Then,inadvancedsystemsettings,createanewvariablecalledPYTHON_NAMEandpastethecopi edpathintoit.

- Searchthepathvariable,chooseitsvalue,andselect'edit'.

- Ifthevaluedoesn'thaveasemicolonattheend,addone,andthentype%PYTHONHOME%.

69. Is it necessary to indent in Python?

Indentation is required in Python. It designates a coding block. An indented block contains all ofthecodeforloops,classes,functions,andsoon.Typically,fourspacecharactersareused.Yourcodew illnot executecorrectlyifit isnotindented, anditwillalso generateerrors.

70. On Unix, how do you make a Python script executable?

The script file should start with #!/usr/bin/env python.

71. What is the use of self in Python?

Self is used to represent the class instance. In Python, you can access the class's attributes andmethods with this keyword. It connects the attributes to the arguments. Self appears in a varietyof contexts and is frequently mistaken for a term. Self is not a keyword in Python, unlike in C++.

72. What are the literals in Python?

For primitive data types, a literal in Python source code indicates a fixed value.

73. What are the types of literals in Python?

For primitive data types, a literal in Python source code indicates a fixed value. Following are the5 types of literal in Python:

- String Literal: A string literal is formed by assigning some text to a variable that is contained insingle or double quotes. Assign the multiline text encased in triple quotes to produce multilineliterals.

- NumericLiteral:Theymaycontainnumericvaluesthatarefloating-pointvalues,integers,orcomplexnumbers.

- CharacterLiteral:Itismadebyputtingasinglecharacterindoublequotes.

- BooleanLiteral:TrueorFalse

- LiteralCollections:Therearefourtypesofliteralssuchaslistcollections,tupleliterals,setliterals,dictionaryliterals,andsetliterals.

74. What are Python modules? Name a few Pythonbuilt-in modules that are often used.

Python modules are files that contain Python code. Functions, classes, or variables can be used inthis code. A Python module is a .py file that contains code that may be executed. The following arethe commonly used built-in modules:

- JSON

- datatime

- random

- math

- sys

- OS

75. What is _init_?

init is a constructor or method in Python. This method is used to allocate memory when anew object is created.

76. What is the Lambda function?

A lambda function is a type of anonymous function. This function can take as many parametersas you want, but just one statement.

77. Why Lambda is used in Python?

Lambda is typically utilized in instances where an anonymous function is required for a shortperiod.Lambda functions can be applied in two different ways:

- AssigningLambdafunctionstoavariable

- WrappingtheLambdafunctionintoanotherfunction

78. How does continue, break, and pass work?

Continue	When a specified condition is met, thecontrol is moved to the beginning ofthe loop, allowing some parts of the loop to be transferred.
Break	When a condition is met, the loop isterminatedandcontrolispassedtothe next statement.

Pass	When you need a piece of code syntactically but don't want to execute it, use this. This is a null operation.

79. What are Python iterators?

Iterators are things that can be iterated through or traversed.

80. Differentiate between range and xrange.

In terms of functionality, xrange, and range are essentially the same. They both provide you the option of generating a list of integers to use whatever you want. The sole difference between range and xrange is that range produces a Python list object whereas x range returns an xrange object. This is especially true if you are working with a machine that requires a lot of memory, such as a phone because range will utilize as much memory as it can to generate your array of numbers, which can cause a memory error and crash your program. It is a beast with a memory problem.

81. What are unpickling and pickling?

The Pickle module takes any Python object and converts it to a string representation, which it then dumps into a file using the dump method. This is known as pickling. Unpickling is the process of recovering original Python objects from a stored text representation.

82. What are generators in Python?

Functions that return an iterable set of items are known as generators.

83. How do you copy an object in Python?

The assignment statement (= operator) in Python does not copy objects. Instead, it establishes a connection between the existing object and the name of the target variable. The copy module is used to make copies of an object in Python. Furthermore, the copy module provides two options for producing copies of a given object –

Deep Copy: Deep Copy recursively replicates all values from the source to the destinationobject, including the objects referenced by the source object.

fromcopyimportcopy,deepcopylis

t_1 = [1, 2, [3, 5], 4]

shallow

copylist_2 =

copy(list_1)list_2[3]

=

7list_2[2].append(6)

list_2#output => [1, 2, [3, 5, 6], 7]

list_1 # output => [1, 2, [3, 5, 6],

4]##deep copy

list_3 = deepcopy(list_1)

list_3[3] =

8list_3[2].append(

7)

list_3   #output=>[1,2,[3,5,6,7],8]

list_1   #output=>[1,2,[3,5,6],4]

Shallow Copy: A bit-wise copy of an object is called a shallow copy. The values in the copiedobject are identical to those in the original object. If one of the values is a reference to anotherobject, only its reference addresses are copied.

84. InPython,areargumentsprovidedbyvalueorreference?

Pass by value: The actual item's copy is passed. Changing the value of the object's copy doesnotaffect the original object's value.

Pass by reference: The actual object is passed as a reference. The value of the old objectwill change if the value of the new object is changed.

Arguments are passed by reference in

Python.def appendNumber(arr):

  arr.append(4)

arr = [1, 2, 3]

print(arr) #Output: => [1, 2,

3]appendNumber(arr)

print(arr) #Output: => [1, 2, 3, 4]

85. How to delete a file in Python?

Use the command os.remove(file_name) to delete a file in Python.

86. Explain join() and split() functions in Python.

The join() function can be used to combine a list of strings based on a delimiter into a singlestring.

Thesplit()functioncanbeusedtosplitastringintoalistofstringsbasedonadelimiter.string =

"This is a string."

string_list = string.split(' ') #delimiter is a 'space' character or '

'print(string_list) #output: ['This', 'is', 'a', 'string.']

print(' '.join(string_list)) #output: This is a string.

87. Explain **kwargs and *args.

*args

- Thefunctiondefinitionusesthe*argssyntaxtopassvariable-lengthparameters.
- "*"denotesvariablelength,while"args"isthestandardname.Anyotherwillsuffice.

**kwargs

- **kwargsisaspecialsyntaxforpassingvariable-lengthkeywordedargumentstofunctions.
- Whenavariableispassedtoafunction,itiscalledakeywordedargument.
- "kwargs"isalsousedbyconventionhere.Youarefreetouseanyothername.

88. What are negative indexes and why are they used?

- Theindexesfromtheendofthelist,tuple,orstringarecallednegativeindexes.
- Arr[-1]denotesthearray'slastelement.Arr[]

89. How will you capitalize the first letter of a string?

Thecapitalize()functioninPythoncapitalizesastring'sinitialletter.Itreturnstheoriginaltextifthe string already contains a capital letter at the beginning.

90. What method will you use to convert a stringto all lowercase?

The lower() function can be used to convert a string to a lowercase.

91. In Python, how do you remark numerous lines?

Comments that involve multiple lines are known as multi-line comments. A # must prefix all linesthat will be commented. You can also use a convenient shortcut to remark several lines. All youhave to do is hold down the ctrl key and left-click anywhere you want a # character to appear,theninput a# once. Thiswill adda commentto every linewhere youput your cursor.

92. What are docstrings?

Docstrings are documentation strings. Within triple quotations are these docstrings. They are notallocated to any variable and, as a result, they can also be used as comments.

93. What is the purpose of 'not', 'is', and 'in' operators?

Special functions are known as operators. They take one or more input values and output a

result.not - returns the boolean value's inverse

is - returns true when both operands are true

in - determines whether a certain element is present in a series

94. WhatarethefunctionsheIp()anddir()usedforinPython?

Both help() and dir() are available from the Python interpreter and are used to provide acondensed list of built-in functions.

dir() function: The defined symbols are displayed using the dir() function.

help() function: The help() function displays the documentation string and also allows you toaccess help for modules, keywords, attributes, and other items.

95. Whyisn'tallthememoryde-allocatedwhenPythonexits?

- When Python quits, some Python modules, especially those with circular references toother objects or objects referenced from global namespaces, are not necessarily freed ordeallocated.

- Python would try to de-allocate/destroy all other objects on exit because it has its ownefficientcleanup mechanism.

- Itisdifficulttode-allocatememorythathasbeenreservedbytheClibrary.

96. What is a dictionary in Python?

A   dictionary is one of Python's built-in datatypes. It establishes a one-to-onecorrespondence between keys and values. Dictionary keys and values are stored in pairs indictionaries. Keys are used to index dictionaries.

97. In Python, how do you utilize ternary operators?

TheTernaryoperatoristheoperatorfordisplayingconditionalstatements.Thisismadeoftrueorfalse values and a statement that must be evaluated.

98. Explain the split(), sub(), and subn() methods of thePython "re" module.

Python's "re" module provides three ways for modifying strings. They

are:split (): a regex pattern is used to "separate" a string into a list

subn(): It works similarly to sub(), returning the new string as well as the number of

replacements.sub(): identifies all substrings that match the regex pattern and replaces them with

a new string

99. What are negative indexes and why do we utilize them?

Pythonsequencesareindexed,andtheyincludebothpositiveandnegativevalues.Positivenumbersar eindexedwith'0'asthefirstindexand'1'asthesecondindex,andsoon.

The index for a negative number begins with '-1,' which is the last index in the sequence andends with '-2,' which is the penultimate index, and the sequence continues like a positivenumber. The negative index is used to eliminate all new-line spaces from the string and allow itto accept the last character S[:-1]. The negative index can also be used to represent the correctorder of the string.

100. Explain Python packages.

PackagesinPythonarenamespacesthatcontainnumerousmodules.

101. What are built-in types of Python?

Given below are the built-in types of Python:

- Built-infunctions
- Boolean
- String
- Complexnumbers
- Floatingpoint
- Integers

102.What are the benefits of NumPy arrays over(nested) Python lists?

- Lists in Python are useful general-purpose containers. They allow for (relatively)quick insertion, deletion, appending, and concatenation, and Python's listcomprehensions make them simple to create and operate.

- They have some limitations: they don't enable "vectorized" operations likeelementwise addition and multiplication, and because they can include objects ofdifferenttypes,Pythonmustmaintaintypeinformationforeachelementandexecutetype dispatching code while working on it.

- NumPyarraysarefaster,andNumPycomeswithseveralfeatures,includinghistograms,algebra,linear,basicstatistics,fastsearching,convolutions,FFTs,andmore.

103. What is the best way to add values to a Python array?

Theappend(),extend(),andinsert(i,x)procedurescanbeusedtoaddelementstoanarray.

104. What is the best way to remove values from a Python array?

Thepop()andremove()methodscanbeusedtoremoveelementsfromanarray.Thedifferencebetweenthese twofunctionsisthatonereturnstheremovedvaluewhiletheotherdoesnot.

105. Is there an object-oriented programming (OOPs) concept in Python?

Python is a computer language that focuses on objects. This indicates that by simply constructing an object model, every program can be solved in Python. Python, on the other hand, may be used as both a procedural and structured language.

106. Differentiate between deep and shallow copy.

When a new instance type is formed, a shallow copy is used to maintain the values that were copied in the previous instance. Shallow copy is used to copy reference pointers in the same way as values are copied. These references refer to the original objects, and any modifications made to any member of the class will have an impact on the original copy. Shallow copy enables faster program execution and is dependent on the size of the data being utilized.

Deep copy is a technique for storing previously copied values. The reference pointers to the objects are not copied during deep copy. It creates a reference to an object and stores the new object that is referenced to another object. The changes made to the original copy will not affect any subsequent copies that utilize the item. Deep copy slows down program performance by creating many copies of each object that is called.

107. What are Python libraries?

A Python library is a group of Python packages. Numpy, Pandas, Matplotlib, Scikit-learn, and many other Python libraries are widely used.

108. Why split is used?

In Python, the split() function is used to split a string.

109. How multithreading is achieved in Python?

- Although Python includes a multi-threading module, it is usually not a good idea to utilize it if you want to multi-thread to speed up your code.

- As this happens so quickly, it may appear to the human eye that your threads are running in parallel, but they are actually sharing the same CPU core.

- The Global Interpreter Lock is a Python concept (GIL). Only one of your 'threads' canexecute at a moment, thanks to the GIL. A thread obtains the GIL, performs somework, and then passes the GIL to the following thread.

110. How are classes created in Python?

The class keyword in Python is used to construct a class.

111. What is pandas dataframe?

A dataframe is a 2D changeable and tabular structure for representing data with rows andcolumns labeled.

112. Explain monkey patching in Python.

Monkey patches are solely used in Python to run-time dynamic updates to a class or module.

113. How Python module is imported?

The import keyword can be used to import modules.

114. What is inheritance in Python?

Inheritance allows one class to gain all of another class's members (for example, attributes andmethods). Inheritance allows for code reuse, making it easier to develop and maintainapplications.

115. What are the different types of inheritance in Python?

The following are the various types of inheritance in Python:

- Singleinheritance:Thememberofasinglesuperclassareacquiredbyaderivedclass.
- Multiple inheritance: More than one base class is inherited by a derived class.
- Muti-level inheritance: D1 is a derived class inherited from base1 while D2 isinherited from base2.

- HierarchicalInheritance:Youcaninheritanynumberofchildclassesfromasinglebase class.

116. Is multiple inheritance possible in Python?

A class can be inherited from multiple parent classes, which is known as multiple inheritance. Incontrast to Java, Python allows multiple inheritance.

117. Explain polymorphism in Python.

The ability to take various forms is known as polymorphism. For example, if the parent class has amethod named ABC, the child class can likewise have a method named ABC with its ownparameters and variables. Python makes polymorphism possible.

118. What is encapsulation in Python?

Encapsulation refers to the joining of code and data. Encapsulation is demonstrated through aPython class.

119. In Python, how do you abstract data?

Onlythenecessarydetailsareprovided,whiletheimplementationishiddenfromview.Interfacesand abstract classes can be used to do this in Python.

120. Are access specifiers used in Python?

Access to an instance variable or function is not limited in Python. To imitate the behavior ofprotected and private access specifiers, Python introduces the idea of prefixing the name of thevariable, function, or method with a single or double underscore.

121. How to create an empty class in Python?

A class that has no code defined within its block is called an empty class. The pass keyword canbe used to generate it. You can, however, create objects of this class outside of the class. Whenusedin Python, thePASS command has noeffect.

122. What does an object() do?

It produces a featureless object that serves as the foundation for all classes. It also does notaccept any parameters.

123. WriteaPythonprogramto generateaStartriangle.

1	def pyfunc(r):
2	forxinrange(r):
3	print(' '*(r-x-1)+'*'*(2*x+1))
4	pyfunc(9)

Output:

```
        *
       ***
      *****
     *******
    *********
   ***********
  *************
 ***************
*****************
```

124. Writeaprogram toproduce theFibonacciseries inPython.

```
# Enterthenumberof
terms
needednbsp;#0,1,1,2,3,5....

a=int(input("Enter the terms"))

f=0;#first element of series

s=1#second element of series

if a=0:

print("Therequestedseriesis",f)

else:

print(f,s,end=" ")

for x in range(2,a):

print(next,end=" ")

f=s

s=next
```

Output: Enter the terms 5 0 1 1 2 3

125.Make a Python program that checks if a sequenceis a Palindrome.

```
a=input("enter sequence")

b=a[::-1]
```

```
if a==b:

  print("palindrome")

else:

print("Not a Palindrome")
```

Output: enter sequence 323 palindrome

126.Make a one-liner that counts how many capital lettersare in a file. Even if the file is too large to fit in memory,your code should work.

1	with open(SOME_LARGE_FILE) as fh:
2	count = 0
3	text = fh.read()
4	for character in text:
5	ifcharacter.isupper():
6	count += 1

Let us transform this into a single line

1	count sum(1 for line in fh forcharacter in line if character.isupper())

127. Can you write a sorting algorithm with a numerical dataset?

```
1    list=["1","4","0","6","9"]

2    list = [int(i) for i in list]

3    list.sort()

4    print (list)
```

128. Check the code given below, and list the final value of A0, A1 …An.

```
1    A0 = dict(zip(('a','b','c','d','e'),(1,2,3,4,5)))

2    A1 = range(10)A2 = sorted([i for i in A1 if i in A0])

3    A3 = sorted([A0[s] for s in A0])

4    A4 = [i for i in A1 if i in A3]

5    A5 = {i:i*i for i in A1}

6    A6 = [[i,i*i] for i in A1]

7    print(A0,A1,A2,A3,A4,A5,A6)
```

Here's the answer:

A0 = {'a': 1, 'c': 3, 'b': 2, 'e': 5, 'd': 4} # The order may vary

A1 = range(0,10)

A2=[]

A3 = [1, 2, 3, 4, 5]

A4 = [1, 2, 3, 4, 5]

A5 = {0: 0, 1: 1, 2: 4, 3: 9, 4: 16, 5: 25, 6: 36, 7: 49, 8: 64, 9: 81}

A6 = [[0, 0], [1, 1], [2, 4], [3, 9], [4, 16], [5, 25], [6, 36], [7, 49], [8, 64], [9, 81]]

129. What is Flask and explain its benefits.

FlaskisaPythonwebmicroframeworkbasedontheBSDlicense.TwoofitsdependenciesareWerkzeug and Jinja2. This means it will have few if any, external library dependencies. Itlightens the framework while reducing update dependencies and security vulnerabilities.

A session is just a way of remembering information from one request to the next. A session in aflask employs a signed cookie to allow the user to inspect and edit the contents of the session. Iftheuseronlyhasthesecretkey,heorshecanchangethesession.Flask.secretkey.

130. Is Django better as compared to Flask?

Django and Flask map URLs or addresses entered into web browsers into Python functions.

Flask is easier to use than Django, but it doesn't do much for you, so you will have to specify thespecifics, whereas Django does a lot for you and you won't have to do anything. Django hasprewritten code that the user must examine, whereas Flask allows users to write their code,making it easier to grasp. Both are technically excellent and have their own set of advantagesand disadvantages.

131. Differentiate between Pyramid, Django, and Flask.

- Pyramid is designed for larger apps. It gives developers flexibility and allows them toutilizetheappropriatetoolsfortheirprojects.Thedatabase,URLstructure,templatingstyle,andotheroptionsareallavailabletothedeveloper.Pyramidscanbeeasily customized.

- Flask is a "microframework" designed for small applications with straightforward needs.External libraries are required in a flask. The flask is now ready for use.

- Django, like Pyramid, may be used for larger applications. It has an ORM in it.

132. InNumPy,howwillyoureadCSVdataintoanarray?

Thismaybeaccomplishedbyutilizingthegenfromtxt()methodwithacommaas thedelimiter.

133. What is GIL?

The term GIL stands for Global Interpreter Lock. This is a mutex that helps threadsynchronization by preventing deadlocks by limiting access to Python objects. GIL assists withmultitasking (and not parallel computing).

134. What is PIP?

PIP denotes Python Installer Package. It is used to install various Python modules. It's acommand-line utility that creates a unified interface for installing various Python modules. Itsearches the internet for the package and installs it into the working directory without requiringany user intervention.

135. What is the use of sessions in the Django framework?

Djangohasasessionfeaturethat allowsyoutostoreand retrievedataforeachsitevisitor. Djangoisolates the process of sending and receiving cookies by keeping all necessary data on the serverside and inserting a session ID cookie on the client side.

136.Writeaprogramthatchecksifallofthenumbersin a sequence are unique.

def check_distinct(data_list):

 if len(data_list) ==

  len(set(data_list)):returnTrue

 else:

  returnFalse;

```
print(check_distinct([1,6,5,8]))    #Prints
```

Trueprint(check_distinct([2,2,5,5,7,8]))#PrintsF

alse

137. What is an operator in Python?

An operator is a symbol that is applied to a set of values to produce a result. An operatormanipulates operands. Numeric literals or variables that hold values are known as operands.Unary, binary, and ternary operators are all possible. The unary operator, requires only oneoperand,thebinaryoperator,requirestwooperands,andtheternaryoperator,requiresthreeoperands.

138. What are the various types of operators in Python?

- Bitwise operators
- Identity operators
- Membership operators
- Logical operators
- Assignment operators
- Relational operators
- Arithmetic operators

139. How to write a Unicode string in Python?

The old Unicode type has been replaced with the "str" type in Python 3, and the string isnow considered Unicode by default. Using the art.title.encode("utf-8") function, we cancreate a Unicode string.

140. Explain the differences between Python 2.x and

Python3.x?

Python2.xisanolderversionofthePythonprogramminglanguage.Python3.xisthemostrecentversion.Python2.xisnolongersupported.Python3.xisthelanguage'spresentandfuture.

InPython2,astringisinherentlyASCII,whileinPython3,itisUnicode.

141. How to send an email in Python language?

Python includes the smtplib and email libraries for sending emails. Import these modules into thenewly generated mail script and send mail to users who have been authenticated.

142.Create a program to add two integers >0 without usingtheplus operator.

```
def add_nums(num1, num2):

  while num2 != 0:

    data = num1 &

    num2num1 = num1 ^

    num2num2 = data <<

    1

  return

num1print(add_nums(2,

10))
```

143.Create a program to convert dates from yyyy-mm-dd todd-mm-by.

Wecanuse thismoduleto convertdates:

```
import re

def transform_date_format(date):

  return re.sub(r'(\d{4})-(\d{1,2})-(\d{1,2})', '\\3-\\2-\\1',

date)date_input = "2021-08-

01"print(transform_date_format(date_input))
```

The datetime module can also be used, as demonstrated below:

```
from datetime import datetime

new_date=datetime.strptime("2021-08-01","%Y-%m-

%d").strftime("%d:%m:%Y")print(new_data)
```

144. Create a program that combines two dictionaries. If youlocate the same keys during combining, you can sum thevaluesofthesesimilarkeys.Createanewdictionary.

```
from collections import Counter

d1 = {'key1': 50, 'key2': 100, 'key3':200}

d2 = {'key1': 200, 'key2': 100, 'key4':300}

new_dict = Counter(d1) +

Counter(d2)print(new_dict)
```

145. Is there an inherent do-while loop in Python?

No.

146. What kind of joins are offered by Pandas?

TherearefourjoinsinPandas:left,inner,right,andouter.

147. How are dataframes in Pandas merged?

The type and fields of the dataframes being merged determine how they are merged. If thedata has identical fields, it is combined along axis 0, otherwise, it is merged along axis 1.

148.What is the best way to get the first five entries of adata frame?

Wemaygetthetopfiveentriesofadataframeusingthehead(5)method.df.head()returnsthetop 5 rows by default. df.head(n) will be used to fetch the top n rows.

149. Howcanyouaccessthedataframe'slatestfiveentries?

Wemaygetthetopfiveentriesofadataframeusingthetail(5)method.df.tail()returnsthetop5rows by default. df.tail(n) will be used to fetch the last n rows.

150. Explainclassifier.

Anydatapoint'sclassispredictedusingaclassifier.Classifiersarehypothesesthatareusedtoassign labels to data items based on their classification.