INTERVIEW QUESTIONS

For

PYTHON

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ANALYTIXLABS

Python Interview Questions and Answers

Q. What is Python?
Ans: Python is a high-level, interpreted, interactive and object-oriented scripting language. Python is designed to be highly readable. It uses English keywords frequently where as other languages use punctuation, and it has fewer syntactical constructions than other languages.
Name some of the features of Python.

Following are some of the salient features of python –

- It supports functional and structured programming methods as well as OOP.
- It can be used as a scripting language or can be compiled to byte-code for building large applications.
- It provides very high-level dynamic data types and supports dynamic type checking.
- It supports automatic garbage collection.
- It can be easily integrated with C, C++, COM, ActiveX, CORBA, and Java.

Q. Is python a case sensitive language?
Ans: Yes! Python is a case sensitive programming language.

Q. Whenever Python exists why all the memory does not de-allocated / freed when Python exits?
Ans: Whenever Python exits, especially those python modules which are having circular references to other objects or the objects that are referenced from the global namespaces are not always de – allocated/freed/uncollectable.
It is impossible to deallocate those portions of memory that are reserved by the C library.
On exit, because of having its own efficient clean up mechanism, Python would try to deallocate/
destroy every object.

Q. Does Python supports interfaces like in Java? Discuss.
Ans: Python does not provide interfaces like in Java. Abstract Base Class (ABC) and its feature are provided by the Python's "abc" module. Abstract Base Class is a mechanism for specifying what methods must be implemented by its implementation subclasses. The use of ABC'c provides a sort of "understanding" about methods and their expected behaviour. This module was made available from Python 2.7 version onwards.

Q. Explain about ODBC and Python?
Ans: ODBC ("Open Database Connectivity) API standard allows the connections with any database that supports the interface, such as PostgreSQL database or Microsoft Access in a transparent manner. There are 3 ODBC modules for Python:

1. PythonWin ODBC module – limited development
2. mxODBC – commercial product
3. pyodbc – it is an open source Python package.

Comparisons:
Q. Compare R and Python
Ans:

***R*:**
- Focuses on better, user friendly data analysis, statistics and graphical models
- The closer you are to statistics, data science and research, the more you might prefer R
- Statistical models can be written with only a few lines in R
- The same piece of functionality can be written in several ways in R
- Mainly used for standalone computing or analysis on individual servers
- Large number of packages, for anything!

Python
- Used by programmers that want to delve into data science
- The closer you are working in an engineering environment, the more you might prefer Python
- Coding and debugging is easier mainly because of the nice syntax
- Any piece of functionality is always written the same way in Python

- When data analysis needs to be implemented with web apps
- Good tool to implement algorithms for production use

Q. Compare Java & Python

A.

Criteria	Java	Python
Ease of use	Good	Very Good
Speed of coding	Average	Excellent
Data types	Static typed	Dynamically typed
Data Science & machine learning applications	Average	Very Good

Q. What is the difference between tuples and lists in Python?

Ans: The main differences between lists and tuples are – Lists are enclosed in brackets ([ ]) and their elements and size can be changed, while tuples are enclosed in parentheses (( )) and cannot be updated. Tuples can be thought of as read-only lists.

Q. How are the functions help() and dir() different?

Ans: These are the two functions that are accessible from the Python Interpreter. These two functions are used for viewing a consolidated dump of built-in functions.

- help() – it will display the documentation string. It is used to see the help related to modules, keywords, attributes, etc.
  To view the help related to string datatype, just execute a statement help(str) – it will display the documentation for 'str, module. ◦ Eg: >>>help(str) or >>>help() – it will open the prompt for help as help>
- to view the help for a module, help> module module name Inorder to view the documentation of 'str' at the help>, type help>modules str
- to view the help for a keyword, topics, you just need to type, help> "keywords python- keyword" and "topics list"
- dir() – will display the defined symbols. Eg: >>>dir(str) – will only display the defined symbols.

Q. Explain different ways to trigger / raise exceptions in your python script?

Ans: The following are the two possible ways by which you can trigger an exception in your Python script.
They are:
raise — it is used to manually raise an exception general-form: raise exception-name ("message to be conveyed")
Eg: >>> voting_age = 15
>>> if voting_age < 18: raise ValueError("voting age should be atleast 18 and above")
output: ValueError: voting age should be atleast 18 and above
2. assert statement are used to tell your program to test that condition attached to assert keyword, and trigger an exception whenever the condition becomes false. Eg: >>> a = -10
>>> assert a > 0 #to raise an exception whenever a is a negative number output: AssertionError
Another way of raising and exception can be done by making a programming mistake, but that's not
usually a good way of triggering an exception.

Q. Differentiate between .py and .pyc files?

Ans: Both .py and .pyc files holds the byte code. ".pyc" is a compiled version of Python file. This file is automatically generated by Python to improve performance. The .pyc file is having byte code which is platform independent and can be executed on any operating system that supports .pyc format.
Note: there is no difference in speed when program is read from .pyc or .py file; the only difference is the load time.

Q. Differentiate between append() and extend() methods. ?

Ans: Both append() and extend() methods are the methods of list. These methods a re used to add the elements at the end of the list.

append(element) – adds the given element at the end of the list which has called this method.
extend(another-list) – adds the elements of another-list at the end of the list which is called the extend method.

Programming:

Q. What is a Python module?
Ans: A module is a Python script that generally contains import statements, functions, classes and variable definitions, and Python runnable code and it "lives" file with a '.py' extension. zip files and DLL files can also be modules. Inside the module, you can refer to the module name as a string that is stored in the global variable name .
A module can be imported by other modules in one of the two ways. They are

1. import
2. from module-name import

Q. Name the File system-related modules in Python?
Ans: Python provides libraries / modules with functions that enable you to manipulate text files and binary files on file system. Using them you can create files, update their contents, copy, and delete files. The libraries are : os, os.path, and shutil.
Here, os and os.path – modules include functions for accessing the file system
shutil – module enables you to copy and delete the files.

Q. Name a few libraries in Python used for Data Analysis and Scientific computations.
Ans: 1.2.3: NumPy, SciPy, Pandas, SciKit, Matplotlib, Seaborn

Q. Which library would you prefer for plotting in Python language: Seaborn or Matplotlib?
Ans: Matplotlib is the python library used for plotting but it needs lot of fine-tuning to ensure that the plots look shiny. Seaborn helps data scientists create statistically and aesthetically appealing meaningful plots. The answer to this question varies based on the requirements for plotting data.

Q. Which python library is built on top of matplotlib and Pandas to ease data plotting?
Ans: Seaborn

Q. Which python library is used for Machine Learning?

Ans: SciKit-Learn.

Q. What is TkInter?
Ans: TkInter is Python library. It is a toolkit for GUI development. It provides support for various GUI tools or widgets (such as buttons, labels, text boxes, radio buttons, etc) that are used in GUI applications. The common attributes of them include Dimensions, Colors, Fonts, Cursors, etc.

Q. What is the purpose of PYTHONPATH environment variable?
Ans: PYTHONPATH – It has a role similar to PATH. This variable tells the Python interpreter where to locate the module files imported into a program. It should include the Python source library directory and the directories containing Python source code. PYTHONPATH is sometimes preset by the Python installer.

Q. What is the purpose of PYTHONSTARTUP environment variable?
Ans: PYTHONSTARTUP – It contains the path of an initialization file containing Python source code. It is executed every time you start the interpreter. It is named as .pythonrc.py in Unix and it contains commands that load utilities or modify PYTHONPATH.

Q. What is the purpose of PYTHONCASEOK environment variable?
Ans: PYTHONCASEOK – It is used in Windows to instruct Python to find the first case-insensitive match in an import statement. Set this variable to any value to activate it.

Q. What is the purpose of PYTHONHOME environment variable?

Ans: PYTHONHOME – It is an alternative module search path. It is usually embedded in the PYTHONSTARTUP or PYTHONPATH directories to make switching module libraries easy.

Q. How instance variables are different from class variables?
Ans: Instance variables: these are the variables in an object that have values that are local to that object. Two objects of the same class maintain distinct values for their variables. These variables are accessed with "object-name.instancevariable-name".
Class variables: these are the variables of class. All the objects of the same class will share value of "Class variables. They are accessed with their class name alone as "class- name.classvariable-name". If you change the value of a class variable in one object, its new value is visible among all other objects of the same class. In the Java world, a variable that is declared as static is a class variable.

Q. What are the supported data types in Python?
Ans: Python has five standard data types –

- Numbers
- String
- List
- Tuple
- Dictionary

Q. What are tuples in Python?
Ans: A tuple is another sequence data type that is similar to the list. A tuple consists of a number of values separated by commas. Unlike lists, however, tuples are enclosed within parentheses.

Q. What is the output of print tuple if tuple = ('abcd', 786 , 2.23, 'john', 70.2)?
Ans: It will print complete tuple. Output would be ('abcd', 786, 2.23, 'john', 70.200000000000003).

Q. What is the output of print tuple[0] if tuple = ('abcd', 786 , 2.23, 'john', 70.2)?
Ans: It will print first element of the tuple. Output would be abcd.

Q. What is the output of print tuple[1:3] if tuple = ('abcd', 786 , 2.23, 'john', 70.2)?
Ans: It will print elements starting from 2nd till 3rd. Output would be (786, 2.23).

Q. What is the output of print tuple[2:] if tuple = ('abcd', 786 , 2.23, 'john', 70.2)?
Ans: It will print elements starting from 3rd element. Output would be (2.23, 'john', 70.200000000000003).

Q. What is the output of print tinytuple * 2 if tinytuple = (123, 'john')?
Ans: It will print tuple two times. Output would be (123, 'john', 123, 'john').

Q. What is the output of print tuple + tinytuple if tuple = ('abcd', 786 , 2.23, 'john', 70.2) and tinytuple = (123, 'john')?
Ans: It will print concatenated tuples. Output would be ('abcd', 786, 2.23, 'john', 70.200000000000003, 123, 'john').

Q. What is the output of print str if str = 'Hello World!'?
Ans: It will print complete string. Output would be Hello World!.

Q. What is the output of print str[0] if str = 'Hello World!'?
Ans: It will print first character of the string. Output would be H.

Q. What is the output of print str[2:5] if str = 'Hello World!'?
Ans: It will print characters starting from 3rd to 5th. Output would be llo.
x`
Q. What is the output of print str[2:] if str = 'Hello World!'?
Ans: It will print characters starting from 3rd character. Output would be llo World!.

Q. What is the output of print str * 2 if str = 'Hello World!'?
Ans: It will print string two times. Output would be Hello World!Hello World!.

Q. What is the output of print str + "TEST" if str = 'Hello World!'?
Ans: It will print concatenated string. Output would be Hello World!TEST.

Q. What is the output of print list if list = ['abcd', 786 , 2.23, 'john', 70.2]?
Ans: It will print concatenated lists. Output would be ['abcd', 786 , 2.23, 'john', 70.2].

Q. What is the output of print list[0] if list = ['abcd', 786 , 2.23, 'john', 70.2]?
Ans: It will print first element of the list. Output would be abcd.

Q. What is the output of print list[1:3] if list = ['abcd', 786 , 2.23, 'john', 70.2]?
Ans: It will print elements starting from 2nd till 3rd. Output would be [786, 2.23].

Q. What is the output of print list[2:] if list = ['abcd', 786 , 2.23, 'john', 70.2]?
Ans: It will print elements starting from 3rd element. Output would be [2.23, 'john', 70.200000000000003].

Q. What is the output of print tinylist * 2 if tinylist = [123, 'john']?
Ans: It will print list two times. Output would be [123, 'john', 123, 'john'].

Q. What is the output of print list + tinylist * 2 if list = ['abcd', 786 , 2.23, 'john', 70.2] and tinylist = [123, 'john']?
Ans: It will print concatenated lists. Output would be ['abcd', 786, 2.23, 'john', 70.2, 123, 'john', 123, 'john'].

Q. If you are gives the first and last names of employees, which data type in Python will you use to store them?
Ans: You can use a list that has first name and last name included in an element or use Dictionary.

Q. What are Python's dictionaries?
Ans: Python's dictionaries are kind of hash table type. They work like associative arrays or hashes found in Perl and consist of key-value pairs. A dictionary key can be almost any Python type, but are usually numbers or strings. Values, on the other hand, can be any arbitrary Python object.

Q. How will you create a dictionary in python?
Ans: Dictionaries are enclosed by curly braces ({ }) and values can be assigned and accessed using square braces ([]).

```
dict = {}
dict['one'] = "This is one"
dict[2]     = "This is two"
tinydict = {'name': 'john','code':6734, 'dept': 'sales'}
```

Q. How will you create a dictionary using tuples in python?
Ans: dict(d) − Creates a dictionary. d must be a sequence of (key,value) tuples.

Q. How will you get all the keys from the dictionary?
Ans: Using dictionary.keys() function, we can get all the keys from the dictionary object.
print dict.keys()   # Prints all the keys

Q. How will you get all the values from the dictionary?
Ans: Using dictionary.values() function, we can get all the values from the dictionary object.
print dict.values()   # Prints all the values

Q. How will you convert a string to an int in python?
Ans: int(x [,base]) − Converts x to an integer. base specifies the base if x is a string.

Q. How will you convert a string to a long in python?
Ans: long(x [,base]) − Converts x to a long integer. base specifies the base if x is a string.

Q. How will you convert a string to a float in python?

Ans: float(x) – Converts x to a floating-point number.

Q. How will you convert a object to a string in python?
Ans: str(x) – Converts object x to a string representation.

Q. How will you convert a object to a regular expression in python?
Ans: repr(x) – Converts object x to an expression string.

Q. How will you convert a String to an object in python?
Ans: eval(str) – Evaluates a string and returns an object.

Q. How will you convert a string to a tuple in python?
Ans: tuple(s) – Converts s to a tuple.

Q. How will you convert a string to a list in python?
Ans: list(s) – Converts s to a list.

Q. How will you convert a string to a set in python?
Ans: set(s) – Converts s to a set.

Q. How will you convert a string to a frozen set in python?
Ans: frozenset(s) – Converts s to a frozen set.

Q. How will you convert an integer to a character in python?
Ans: chr(x) – Converts an integer to a character.

Q. How will you convert an integer to an unicode character in python?
Ans: unichr(x) – Converts an integer to a Unicode character.

Q. How will you convert a single character to its integer value in python?
Ans: ord(x) – Converts a single character to its integer value.

Q. How will you convert an integer to hexadecimal string in python?
Ans: hex(x) – Converts an integer to a hexadecimal string.

Q. How will you convert an integer to octal string in python?
Ans: oct(x) – Converts an integer to an octal string.

Q. Write code to sort a DataFrame in Python in descending order.
Ans: MyData.sort_values(ColumnName, ascending = False)

Q. How can you handle duplicate values in a dataset for a variable in Python?
Ans: MyData.loc[-duplicated(MyData)] # to get all unique rows in the data. (remove the – sign to get all repeated rows)
MyData.loc[-duplicated(MyData.ColumnName)] # to get all unique rows wrt a certain column. (remove the – sign to get all repeated rows)

Q. Which method in pandas.tools.plotting is used to create scatter plot matrix?
Ans: 5.6.7.8.9: Scatter_matrix

Q. How can you check if a data set or time series is Random?
Ans: To check whether a dataset is random or not use the lag plot. If the lag plot for the given dataset does not show any structure then it is random.

Q. What are the possible ways to load an array from a text data file in Python? How can the efficiency of the code to load data file be improved?
Ans: 11.12.13: numpy.loadtxt ()

Q. Which is the standard data missing marker used in Pandas?
Ans: 14: NaN

Q. Which Python library would you prefer to use for Data Munging?
Ans: Pandas

Q. What is pylab?
Ans: A package that combines NumPy, SciPy and Matplotlib into a single namespace.

Q. How can you randomize the items of a list in place in Python?

Ans: Shuffle (lst) can be used for randomizing the items of a list in Python

Q. What is a pass in Python?
Ans: Pass in Python signifies a no operation statement indicating that nothing is to be done.

Q. What happens when you execute the statement mango=banana in Python?
Ans: A name error will occur when this statement is executed in Python.

Q. Write a sorting algorithm for a numerical dataset in Python.
Ans: Sorted = MyData.sort_values([“ColumnName”],ascending = True)

Q. Optimize the below python code-
word = ‘word’
print word.__len__ ()
Ans: print ‘word’._len_ ()

Q. What is monkey patching in Python?
Ans: Monkey patching is a technique that helps the programmer to modify or extend other code at runtime. Monkey patching comes handy in testing but it is not a good practice to use it in production environment as debugging the code could become difficult.

Q. Which tool in Python will you use to find bugs if any?
Ans: Pylint and Pychecker. Pylint verifies that a module satisfies all the coding standards or not. Pychecker is a static analysis tool that helps find out bugs in the course code.

Q. How are arguments passed in Python- by reference or by value?
Ans: The answer to this question is neither of these because passing semantics in Python are completely different. In all cases, Python passes arguments by value where all values are references to objects.

Q. You are given a list of N numbers. Create a single list comprehension in Python to create a new list that contains only those values which have even numbers from elements of the list at even indices. For instance if list[4] has an even value the it has be included in the new output list because it has an even index but if list[5] has an even value it should not be included in the list because it is not at an even index.
[x for x in list [1::2] if x%2 == 0]
Ans: The above code will take all the numbers present at even indices and then discard the odd numbers.

Q. Explain the usage of decorators.
Ans: Decorators in Python are used to modify or inject code in functions or classes. Using decorators, you can wrap a class or function method call so that a piece of code can be executed before or after the execution of the original code. Decorators can be used to check for permissions, modify or track the arguments passed to a method, logging the calls to a specific method, etc.

Q. What is the purpose of ‘’ operator?**

Ans: ** Exponent – Performs exponential (power) calculation on operators. a**b = 10 to the power 20 if a = 10 and b = 20.

Q. What is the purpose of ‘//’ operator?

Ans: // Floor Division – The division of operands where the result is the quotient in which the digits after the decimal point are removed.

Q. What is the purpose of 'is' operator?
Ans: is – Evaluates to true if the variables on either side of the operator point to the same object and false otherwise. x is y, here is results in 1 if id(x) equals id(y).

Q. What is the purpose of 'not in' operator?
Ans: not in – Evaluates to true if it does not finds a variable in the specified sequence and false otherwise. x not in y, here not in results in a 1 if x is not a member of sequence y.

Q. What is the purpose break statement in python?
Ans: break statement – Terminates the loop statement and transfers execution to the statement immediately following the loop.

Q. What is the purpose continue statement in python?
Ans: continue statement – Causes the loop to skip the remainder of its body and immediately retest its condition prior to reiterating.

Q. What is the purpose pass statement in python?
Ans: pass statement – The pass statement in Python is used when a statement is required syntactically but you do not want any command or code to execute.

Q. How can you pick a random item from a list or tuple?
Ans: choice(seq) – Returns a random item from a list, tuple, or string.

Q. How can you pick a random item from a range?
Ans: randrange ([start,] stop [,step]) – returns a randomly selected element from range(start, stop, step).

Q. How can you get a random number in python?
Ans: random() – returns a random float r, such that 0 is less than or equal to r and r is less than 1.

Q. How will you set the starting value in generating random numbers?
Ans: seed([x]) – Sets the integer starting value used in generating random numbers. Call this function before calling any other random module function. Returns None.

Q. How will you randomizes the items of a list in place?
Ans: shuffle(lst) – Randomizes the items of a list in place. Returns None.

Q. How will you capitalizes first letter of string?
Ans: capitalize() – Capitalizes first letter of string.

Q. How will you check in a string that all characters are alphanumeric?
Ans: isalnum() – Returns true if string has at least 1 character and all characters are alphanumeric and false otherwise.

Q. How will you check in a string that all characters are digits?
Ans: isdigit() – Returns true if string contains only digits and false otherwise.

Q. How will you check in a string that all characters are in lowercase?
Ans: islower() – Returns true if string has at least 1 cased character and all cased characters are in lowercase and false otherwise.

Q. How will you check in a string that all characters are numerics?
Ans: isnumeric() – Returns true if a unicode string contains only numeric characters and false otherwise.

Q. How will you check in a string that all characters are whitespaces?
Ans: isspace() – Returns true if string contains only whitespace characters and false otherwise.

Q. How will you check in a string that it is properly titlecased?

Ans: istitle() – Returns true if string is properly "titlecased" and false otherwise.

Q. How will you check in a string that all characters are in uppercase?
Ans: isupper() – Returns true if string has at least one cased character and all cased characters are in uppercase and false otherwise.

Q. How will you merge elements in a sequence?
Ans: join(seq) – Merges (concatenates) the string representations of elements in sequence seq into a string, with separator string.

Q. How will you get the length of the string?
Ans: len(string) – Returns the length of the string.

Q. How will you get a space-padded string with the original string left-justified to a total of width columns?
Ans: ljust(width[, fillchar]) – Returns a space-padded string with the original string left-justified to a total of width columns.

Q. How will you convert a string to all lowercase?
Ans: lower() – Converts all uppercase letters in string to lowercase.

Q. How will you remove all leading whitespace in string?
Ans: lstrip() – Removes all leading whitespace in string.

Q. How will you get the max alphabetical character from the string?
Ans: max(str) – Returns the max alphabetical character from the string str.

Q. How will you get the min alphabetical character from the string?
Ans: min(str) – Returns the min alphabetical character from the string str.

Q. How will you replaces all occurrences of old substring in string with new string?
Ans: replace(old, new [, max]) – Replaces all occurrences of old in string with new or at most max occurrences if max given.

Q. How will you remove all leading and trailing whitespace in string?
Ans: strip([chars]) – Performs both lstrip() and rstrip() on string.

Q. How will you change case for all letters in string?
Ans: swapcase() – Inverts case for all letters in string.

Q. How will you get titlecased version of string?
Ans: title() – Returns "titlecased" version of string, that is, all words begin with uppercase and the rest are lowercase.

Q. How will you convert a string to all uppercase?
Ans: upper() – Converts all lowercase letters in string to uppercase.

Q. How will you check in a string that all characters are decimal?
Ans: isdecimal() – Returns true if a unicode string contains only decimal characters and false otherwise.

Q. What is the difference between del() and remove() methods of list?
Ans: To remove a list element, you can use either the del statement if you know exactly which element(s) you are deleting or the remove() method if you do not know.

Q. What is the output of len([1, 2, 3])?
Ans: 3

Q. What is the output of [1, 2, 3] + [4, 5, 6]?
Ans: [1, 2, 3, 4, 5, 6]

Q. What is the output of ['Hi!'] * 4?

['Hi!', 'Hi!', 'Hi!', 'Hi!']

Q. What is the output of 3 in [1, 2, 3]?
Ans: True

Q. What is the output of for x in [1, 2, 3]: print x?
Ans: 1 2 3

Q. What is the output of L[2] if L = [1,2,3]?
Ans: 3, Offsets start at zero.

Q. What is the output of L[-2] if L = [1,2,3]?
Ans: L[-1] = 3, L[-2]=2, L[-3]=1

Q. What is the output of L[1:] if L = [1,2,3]?
Ans: 2, 3, Slicing fetches sections.

Q. How will you compare two lists?
Ans: cmp(list1, list2) − Compares elements of both lists.

Q. How will you get the length of a list?
Ans: len(list) − Gives the total length of the list.

Q. How will you get the max valued item of a list?
Ans: max(list) − Returns item from the list with max value.

Q. How will you get the min valued item of a list?
Ans: min(list) − Returns item from the list with min value.

Q. How will you get the index of an object in a list?
Ans: list.index(obj) − Returns the lowest index in list that obj appears.

Q. How will you insert an object at given index in a list?
Ans: list.insert(index, obj) − Inserts object obj into list at offset index.

Q. How will you remove last object from a list?
Ans: list.pop(obj=list[-1]) − Removes and returns last object or obj from list.

Q. How will you remove an object from a list?
Ans: list.remove(obj) − Removes object obj from list.

Q. How will you reverse a list?
Ans: list.reverse() − Reverses objects of list in place.

Q. How will you sort a list?
Ans: list.sort([func]) − Sorts objects of list, use compare func if given.

Q. What will be the output of the below Python code –

```
def multipliers ():
  return [lambda x: i * x for i in range (4)]
  print [m (2) for m in multipliers ()]
```

Ans: The output for the above code will be [6, 6,6,6]. The reason for this is that because of late binding the value of the variable i is looked up when any of the functions returned by multipliers are called.

Q. What do you mean by list comprehension?

Ans: The process of creating a list while performing some operation on the data so that it can be accessed using an iterator is referred to as List Comprehension.
Example:
[ord (j) for j in string.ascii_uppercase]
[65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90]

Q. What will be the output of the below code?
word = 'aeioubcdfg'
print word [:3] + word [3:]
Ans: The output for the above code will be: 'aeioubcdfg'.

In string slicing when the indices of both the slices collide and a "+" operator is applied on the string it concatenates them.

Q. list= ['a','e','i','o','u']
print list [8:]
Ans: The output for the above code will be an empty list []. Most of the people might confuse the answer with an index error because the code is attempting to access a member in the list whose index exceeds the total number of members in the list. The reason being the code is trying to access the slice of a list at a starting index which is greater than the number of members in the list.

Q. What will be the output of the below code:
Ans: def foo (i= []):
  i.append (1)
  return i
>>> foo ()
>>> foo ()
The output for the above code will be-
[1]
[1, 1]
Argument to the function foo is evaluated only once when the function is defined. However, since it is a list, on every all the list is modified by appending a 1 to it.

Q. Can the lambda forms in Python contain statements?
Ans: No, as their syntax is restricted to single expressions and they are used for creating function objects which are returned at runtime.

Q. What is PEP8?
Ans: PEP8 consists of coding guidelines for Python language so that programmers can write readable code making it easy to use for any other person, later on.

Q. Is all the memory freed when Python exits?
Ans: No it is not, because the objects that are referenced from global namespaces of Python modules are not always de-allocated when Python exits.

Q. Which command do you use to exit help window or help command prompt?
Ans: Quit. When you type quit at the help's command prompt, python shell prompt will appear by closing the help window automatically.

Q. Does the functions help() and dir() list the names of all the built_in functions and variables? If no, how would you list them?
Ans: No. Built-in functions such as max(), min(), filter(), map(), etc is not apparent immediately as they are
available as part of standard module.To view them, we can pass the module " builtins " as an argument to "dir()". It will display the
built-in functions, exceptions, and other objects as a list.>>>dir(__builtins)
['ArithmeticError', 'AssertionError', 'AttributeError', ……]

Q. Explain how Python does Compile-time and Run-time code checking?

Ans: Python performs some amount of compile-time checking, but most of the checks such as type, name, etc are postponed until code execution. Consequently, if the Python code references a user -defined function that does not exist, the code will compile successfully. In fact, the code will fail with an exception only when the code execution path references the function which does not exists.

Q. Explain Python's zip() function.?
Ans:
zip() function- it will take multiple lists say list1, list2, etc and transform them into a single list of tuples by taking the corresponding elements of the lists that are passed as parameters.
Eg:
list1 = ['A','B','C'] and list2 = [10,20,30].
zip(list1, list2) # results in a list of tuples say [('A',10),('B',20),('C',30)]
whenever the given lists are of different lengths, zip stops generating tuples when the first list ends.

Q. As Everything in Python is an Object, Explain the characteristics of Python's Objects.
Ans: As Python's Objects are instances of classes, they are created at the time of instantiation.
Eg: object-name = class-name(arguments)
one or more variables can reference the same object in Python
Every object holds unique id and it can be obtained by using id() method. Eg: id(obj-name) will return unique id of the given object.
every object can be either mutable or immutable based on the type of data they hold.
Whenever an object is not being used in the code, it gets destroyed automatically garbage collected or destroyed
contents of objects can be converted into string representation using a method

Q. Explain how to overload constructors or methods in Python.
Ans: Python's constructor – _init__ () is a first method of a class. Whenever we try to instantiate a object __init__() is automatically invoked by python to initialize members of an object.

Q. Which statement of Python is used whenever a statement is required syntactically but the program needs no action?
Ans: Pass – is no-operation / action statement in Python
If we want to load a module or open a file, and even if the requested module/file does not exist, we want to continue with other tasks. In such a scenario, use try-except block with pass statement in the except block.
Eg: try:import mymodulemyfile = open("C:\myfile.csv")except:pass

Q. What is Web Scraping? How do you achieve it in Python?
Ans: Web Scrapping is a way of extracting the large amounts of information which is available on the web sites and saving it onto the local machine or onto the database tables.
In order to scrap the web:load the web page which is interesting to you. To load the web page, use "requests" module.
parse HTML from the web page to find the interesting information.Python has few modules for scraping the web. They are urllib2, scrapy, pyquery, BeautifulSoap, etc.

Q. Explain the use of with statement?
Ans: In python generally "with" statement is used to open a file, process the data present in the file, and also to close the file without calling a close() method. "with" statement makes the exception handling simpler by providing cleanup activities.

General form of with:
with open("file name", "mode") as file-var:

processing statements
note: no need to close the file by calling close() upon file-var.close()

Q. Explain all the file processing modes supported by Python?
Ans: Python allows you to open files in one of the three modes. They are:
read-only mode, write-only mode, read-write mode, and append mode by specifying the flags "r", "w", "rw", "a" respectively.

A text file can be opened in any one of the above said modes by specifying the option "t" along with "r", "w", "rw", and "a", so that the preceding modes become "rt", "wt", "rwt", and "at".A binary file can be opened in any one of the above said modes by specifying the option "b" along with "r", "w", "rw", and "a" so that the preceding modes become "rb", "wb", "rwb", "ab".

Q. Explain how to redirect the output of a python script from standout(ie., monitor) on to a file ?

Ans: They are two possible ways of redirecting the output from standout to a file.

1. Open an output file in "write" mode and the print the contents in to that file, using sys.stdout attribute.
   import sys
   filename = "outputfile" sys.stdout = open() print "testing"
2. you can create a python script say .py file with the contents, say print "testing" and then redirect it to the output file while executing it at the command prompt.
   Eg: redirect_output.py has the following code:

3. print "Testing"
4. execution: python redirect_output.py > outputfile.

Q. Explain the shortest way to open a text file and display its contents?

Ans: The shortest way to open a text file is by using "with" command as follows:

```
with open("file-name", "r") as fp:
fileData = fp.read()
#to print the contents of the file print(fileData)
```

Q. How do you create a dictionary which can preserve the order of pairs?

Ans: We know that regular Python dictionaries iterate over <key, value> pairs in an arbitrary order, hence they do not preserve the insertion order of <key, value> pairs.

Python 2.7. introduced a new "OrderDict" class in the "collections" module and it provides the same interface like the general dictionaries but it traverse through keys and values in an ordered manner depending on when a key was first inserted.

Eg: from collections import OrderedDict

```
d = OrderDict([('Company-id':1),('Company-Name':'Intellipaat')])
d.items() # displays the output as: [('Company-id':1),('Company-Name':'Intellipaat')]
```

Q. When does a dictionary is used instead of a list?

Ans: Dictionaries – are best suited when the data is labelled, i.e., the data is a record with field names.

lists – are better option to store collections of un-labelled items say all the files and sub directories in a folder. List comprehension is used to construct lists in a natural way.

Generally Search operation on dictionary object is faster than searching a list object.

Q. What is the use of enumerate() in Python?

Ans: Using enumerate() function you can iterate through the sequence and retrieve the index position and its corresponding value at the same time.

```
>>> for i,v in enumerate(['Python','Java','C++']):
print(i,v)
0 Python
1 Java
2 C++
```

Q. How many kinds of sequences are supported by Python? What are they?

Python supports 7 sequence types. They are str, list, tuple, unicode, bytearray, xrange, and buffer. where xrange is deprecated in python 3.5.X.

Q. How do you perform pattern matching in Python? Explain

Ans: Regular Expressions/REs/ regexes enable us to specify expressions that can match specific "parts" of a given string. For instance, we can define a regular expression to match a single character or a digit, a telephone number, or an email address, etc.The Python's "re" module provides regular

expression patterns and was introduce from later versions of Python 2.5. “re” module is providing methods for search text strings, or replacing text strings along with methods for splitting text strings based on the pattern defined.

Q. Name few methods for matching and searching the occurrences of a pattern in a given text String?
Ans: There are 4 different methods in “re” module to perform pattern matching. They are:
match() – matches the pattern only to the beginning of the String. search() – scan the string and look for a location the pattern matches findall() – finds all the occurrences of match and return them as a list
finditer() – finds all the occurrences of match and return them as an iterator.

Q. Explain split(), sub(), subn() methods of
Ans: To modify the strings, Python’s “re” module is providing 3 methods. They are:
split() – uses a regex pattern to “split” a given string into a list.
sub() – finds all substrings where the regex pattern matches and then replace them with a different string
subn() – it is similar to sub() and also returns the new string along with the no. of
replacements.

Q. How to display the contents of text file in reverse order?
Ans:

1. convert the given file into a list.
2. reverse the list by using reversed()
   Eg: for line in reversed(list(open(“file-name”,”r”))):
   print(line)

Q. What is JSON? How would convert JSON data into Python data?
Ans: JSON – stands for JavaScript Object Notation. It is a popular data format for storing data in NoSQL databases. Generally JSON is built on 2 structures.

1. A collection of <name, value> pairs.
2. An ordered list of values.
   As Python supports JSON parsers, JSON-based data is actually represented as a dictionary in Python. You can convert json data into python using load() of json module.

Q. Name and explain the three magic methods of Python that are used in the construction and initialization of custom Objects.
Ans:

The 3 magic methods of Python that are used in the construction and initialization of custom Objects are: init__, new , and del__.
1. new – this method can be considered as a “constructor”. It is invoked to create an instance of a class with the statement say, myObj = MyClass()
2. init__ — It is an “initializer”/ “constructor” method. It is invoked whenever any arguments are passed at the time of creating an object. myObj = MyClass(‘Pizza’,25)
3. del- this method is a “destructor” of the class. Whenever an object is deleted,
invocation of del__ takes place and it defines behaviour during the garbage collection. Note: new , del are rarely used explicitly.

Q. Is Python object oriented? what is object oriented programming?
Ans: Yes. Python is Object Oriented Programming language. OOP is the programming paradigm based on classes and instances of those classes called objects. The features of OOP are:
Encapsulation, Data Abstraction, Inheritance, Polymorphism.

Q. What is a Class? How do you create it in Python?
Ans: A class is a blue print/ template of code /collection of objects that has same set of attributes and behaviour. To create a class use the keyword class followed by class name beginning with an uppercase letter. For example, a person belongs to class called Person class and can have the attributes (say first-name and last-name) and behaviours / methods (say showFullName()). A Person class can be defined as:
class Person():
#method
def inputName(self,fname,lname): self.fname=fname self.lastname=lastname
#method

def showFullName() (self):

print(self.fname+" "+self.lname)person1 = Person() #object instantiation person1.inputName("Ratan","Tata") #calling a method inputName person1. showFullName() #calling a method showFullName()

Note: whenever you define a method inside a class, the first argument to the method must be self (where self – is a pointer to the class instance). self must be passed as an argument to the method, though the method does not take any arguments.

Q. What are Exception Handling? How do you achieve it in Python?
Ans: Exception Handling prevents the codes and scripts from breaking on receipt of an error at run -time might be at the time doing I/O, due to syntax errors, data types doesn't match. Generally it can be used for handling user inputs.
The keywords that are used to handle exceptions in Python are:

try – it will try to execute the code that belongs to it. May be it used anywhere that keyboard input is required.

except – catches all errors or can catch a specific error. It is used after the try block.x = 10 + 'Python' #TypeError: unsupported operand type(s) ….
try:
x = 10 + 'Python'
except:
print("incompatible operand types to perform sum")
raise – force an error to occur
o raise TypeError("dissimilar data types")
finally – it is an optional clause and in this block cleanup code is written here following "try" and "except".

Q. Explain Inheritance in Python with an example.
Ans: Inheritance allows One class to gain all the members(say attributes and methods) of another class. Inheritance provides code reusability, makes it easier to create and maintain an application. They are different types of inheritance supported by Python. They are: single, multi-level, hierarchical and multiple inheritance. The class from which we are inheriting is called super-class and the class that is inherited is called a derived / child class.
Single Inheritance – where a derived class acquires the members of a single super class.
multi-level inheritance – a derived class d1 in inherited from base class base1, and d2 is inherited from base2.
hierarchical inheritance – from one base class you can inherit any number of child classes
multiple inheritance – a derived class is inherited from more than one base class.
ex:
class ParentClass:
v1 = "from ParentClass - v1"
v2 = "from ParentClass - v2"class ChildClass(ParentClass):
passc = ChildClass() print(c.v1) print(c.v2)

Q. What is multithreading? Give an example.
Ans: It means running several different programs at the same time concurrently by invoking multiple threads. Multiple threads within a process refer the data space with main thread and they can communicate with each other to share information more easily. Threads are light-weight processes and have less memory overhead. Threads can be used just for quick task like calculating results and also running other processes in the background while the main program is running.

Q. How is Inheritance and Overriding methods are related?
Ans: If class A is a sub class of class B, then everything in B is accessible in /by class A. In addition, class A can define methods that are unavailable in B, and also it is able to override methods in B. For Instance, If class B and class A both contain a method called func(), then func() in class B can override func() in class A. Similarly, a method of class A can call another method defined in A that can invoke a method of B that overrides it.

Q. Which methods of Python are used to determine the type of instance and inheritance?
Ans: Python has 2 built-in functions that work with inheritance:
isinstance() – this method checks the type of instance.

for eg, isinstance(myObj, int) – returns True only when “myObj. class ” is “int”.
issubclass() – this method checks class inheritance
for eg: issubclass(bool, int) – returns True because “bool” is a subclass of “int”.
issubclass(unicode, str) – returns False because “unicode” is not a subclass of “str”.

Q. In the case of Multiple inheritance, if a child class C is derived from two base classes say A and B as: class C(A, B): -- which parent class's method will be invoked by the interpreter?
Ans: Whenever object of class C calls a method func() that is existing in both the parent classes say A and B and does not exist in class C since class C does not contain the definition of the method func(), the Python searches for the func() in parent classes. Since the search is performed in a left-to-right fashion, Python executes the method func() present in class A and not the func() method in B.

Q. How to retrieve data from a table in MySQL database through Python code? Explain.
Ans:

1. import MySQLdb module as : import MySQLdb

2. establish a connection to the database.
   db = MySQLdb.connect(“host”=”local host”, “database-user”=”user-name”, “password”=”password”, “database-name”=”database”)
3. initialize the cursor variable upon the established connection: c1 = db.cursor()
4. retrieve the information by defining a required query string. s = “Select * from dept”
5. fetch the data using fetch() methods and print it. data = c1.fetch(s)
6. close the database connection. db.close()

Q. How would you define a protected member in a Python class?
Ans: All the members of a class in Python are public by default. You don’t need to define an access specifier for members of class. By adding ‘_’ as a prefix to the member of a class, by convetion you are telling others please don’t this object, if you are not a subclass the respective class.
Eg: class Person:
empid = None
_salary = None #salary is a protected member & it can accessible by the subclasses of Person

Q. Name few Python Web Frameworks for developing web applications?
Ans:
There are various web frameworks provided by Python. They are
web2py – it is the simplest of all the web frameworks used for developing web applications.
cherryPy – it is a Python-based Object oriented Web framework.
Flask – it is a Python-based micro-framework for designing and developing web applications.

Q. How do you check the file existence and their types in Python?
Ans: os.path.exists() – use this method to check for the existence of a file. It returns True if the file exists, false otherwise. Eg: import os; os.path.exists(‘/etc/hosts’)
os.path.isfile() – this method is used to check whether the give path references a file or not. It returns True if the path references to a file, else it returns false. Eg: import os; os.path.isfile(‘/etc/hosts’)
os.path.isdir() – this method is used to check whether the give path references a directory or not. It returns True if the path references to a directory, else it returns false. Eg: import os; os.path.isfile(‘/etc/hosts’)
os.path.getsize() – returns the size of the given file
os.path.getmtime() – returns the timestamp of the given path.

Q. Name few methods that are used to implement Functionally Oriented Programming in Python?
Ans:
Python supports methods (called iterators in Python3), such as filter(), map(), and reduce(), that are very useful when you need to iterate over the items in a list, create a dictionary, or extract a subset of a list.
filter() – enables you to extract a subset of values based on conditional logic.
map() – it is a built-in function that applies the function to each item in an iterable.
reduce() – repeatedly performs a pair-wise reduction on a sequence until a single value is computed.

Formatting:

Q. How do you remove duplicates from a list?
Ans:
a. sort the list
b. scan the list from the end.
c. while scanning from right-to-left, delete all the duplicate elements from the list

Q. What does _init_.py do?

Ans: _init_.py is an empty py file used for importing a module in a directory. _init_.py provides an easy way to organize the files. If there is a module maindir/subdir/module.py,_init_.py is placed in all the directories so that the module can be imported using the following command-
import maindir.subdir.module

Q. How can you copy objects in Python?
Ans: The functions used to copy objects in Python are-
1) Copy.copy () for shallow copy
2) Copy.deepcopy () for deep copy
However, it is not possible to copy all objects in Python using these functions. For instance, dictionaries have a separate copy method whereas sequences in Python have to be copied by 'Slicing'.

Others:

Q .Which plot will you use to access the uncertainty of a statistic?
Ans: Bootstrap

Q. Name few Python modules for Statistical, Numerical and scientific computations?
numPy – this module provides an array/matrix type, and it is useful for doing computations on arrays. scipy – this module provides methods for doing numeric integrals, solving differential equations, etc pylab – is a module for generating and saving plots
matplotlib – used for managing data and generating plots.

Question Context 1:

You must have seen the show "How I met your mother". Do you remember the game where they played, in which each person drinks a shot whenever someone says "but, um". I thought of adding a twist to the game. What if you could use your technical skills to play this game? To identify how many shots a person is having in the entire game, you are supposed to write a code.

Below is the subtitle sample script.

Note: Python regular expression library has been imported as re.

```
txt = '''450
 00:17:53,457 --> 00:17:56,175
 Okay, but, um,
 thanks for being with us.
451
 00:17:56,175 --> 00:17:58,616
 But, um, if there's any
 college kids watching,
452
 00:17:58,616 --> 00:18:01,610
 But, um, but, um, but, um,
 but, um, but, um,
453
```

Ans:

```
 00:18:01,610 --> 00:18:03,656
```

We have to drink, professor.
454
00:18:03,656 --> 00:18:07,507
It's the rules.
She said "But, um"
455
00:18:09,788 --> 00:18:12,515
But, um, but, um, but, um...
god help us all.
'''

Q. Which of the following codes would be appropriate for this task?
Ans:
A) len(re.findall('But, um', txt))
B) re.search('But, um', txt).count()
C) len(re.findall('[B,b]ut, um', txt))
D) re.search('[B,b]ut, um', txt)).count()

Solution: (C)
You have to find both capital and small versions of "but" So option C is correct.

Question Context 2:

Q. Suppose you are given the below string
Ans:
str = """Email_Address,Nickname,Group_Status,Join_Year
aa@aaa.com,aa,Owner,2014
bb@bbb.com,bb,Member,2015
cc@ccc.com,cc,Member,2017
dd@ddd.com,dd,Member,2016
ee@eee.com,ee,Member,2020
"""
In order to extract only the domain names from the email addresses from the above string (for eg. "aaa", "bbb"..) you write the following code:

```
for i in re.finditer('([a-zA-Z]+)@([a-zA-Z]+).(com)', str):
    print i.group(__)
```

Q. What number should be mentioned instead of "__" to index only the domains?
Note: Python regular expression library has been imported as re.
Ans:
A) 0
B) 1
C) 2
D) 3
Solution: (C)

Question Context 3

Your friend has a hypothesis – "*All those people who have names ending with the sound of "y" (Eg: Hollie) are intelligent people.*" Please note: The name should end with the sound of 'y' but not end with alphabet 'y'.
Now you being a data freak, challenge the hypothesis by scraping data from your college's website. Here's data you have collected.
Ans:

Name	Marks

Andy	0
Mandi	10
Sandy	20
Hollie	18
Molly	19
Dollie	15

You want to make a list of all people who fall in this category. You write following code do to the same:

```
temp = []
 for i in re.finditer(pattern, str):
    temp.append(i.group(1))
```

Q. What should be the value of "pattern" in regular expression?

Note: Python regular expression library has been imported as re.

Ans:
A) pattern = '(i|ie)(,)'
B) pattern = '(i$|ie$)(,)'
C) pattern = '([a-zA-Z]+i|[a-zA-Z]+ie)(,)'
D) None of these
Solution: (B)

You have to find the pattern the end in either "i" or "ie". So option B is correct.

Question Context 4

Assume, you are given two lists:
a = [1,2,3,4,5]
b = [6,7,8,9]
The task is to create a list which has all the elements of a and b in one dimension.
Output:

a = [1,2,3,4,5,6,7,8,9]

Q. Which of the following option would you choose?
Ans:
A) a.append(b)
B) a.extend(b)
C) Any of the above
D) None of these

Solution: (B)
Option B is correct

Q. You have built a machine learning model which you wish to freeze now and use later. Which of the following command can perform this task for you?

Note: Pickle library has been imported as pkl.
Ans:
A) push(model, “file”)
B) save(model, “file”)
C) dump(model, “file”)
D) freeze(model, “file”)

Solution: (C)
Option C is correct

Question Context 6

We want to convert the below string in date-time value:
import time
str = '21/01/2017'
datetime_value = time.strptime(str,*date_format*)

Q. To convert the above string, what should be written in place of *date_format*?
Ans:
A) “%d/%m/%y”
B) “%D/%M/%Y”
C) “%d/%M/%y”
D) “%d/%m/%Y”
Solution: (D)
Option D is correct

Question Context 7

I have built a simple neural network for an image recognition problem. Now, I want to test if I have assigned the weights & biases for the hidden layer correctly. To perform this action, I am giving an identity matrix as input. Below is my identity matrix:

A = [1, 0, 0
0, 1, 0
0, 0, 1]

Q. How would you create this identity matrix in python?
Note: Library numpy has been imported as np.
Ans:
A) np.eye(3)
B) identity(3)
C) np.array([1, 0, 0], [0, 1, 0], [0, 0, 1])
D) All of these
Solution: (A)

Option B does not exist (it should be np.identity()). And option C is wrong, because the syntax is incorrect. So the answer is option A

Q. To check whether the two arrays occupy same space, what would you do?

I have two numpy arrays “e” and “f”.

You get the following output when you print “e” & “f”
print e
[1, 2, 3, 2, 3, 4, 4, 5, 6]

print f
[[1, 2, 3], [2, 3, 4], [4, 5, 6]]

When you change the values of the first array, the values for the second array also changes. This creates a problem while processing the data. For example, if you set the first 5 values of e as 0; i.e.
print e[:5]
0
the final values of e and f are

print e
[0, 0, 0, 0, 0, 4, 4, 5, 6]
print f
[[0, 0, 0], [0, 0, 4], [4, 5, 6]]

You surmise that the two arrays must have the same space allocated.

Ans:
A) Check memory of both arrays, if they match that means the arrays are same.
B) Do "np.array_equal(e, f)" and if the output is "True" then they both are same
C) Print flags of both arrays by e.flags and f.flags; check the flag "OWNDATA". If one of them is False, then both the arrays have same space allocated.
D) None of these

Solution: (C)
Option C is correct

Question Context 9

Suppose you want to join train and test dataset (both are two numpy arrays train_set and test_set) into a resulting array (resulting_set) to do data processing on it simultaneously. This is as follows:
train_set = np.array([1, 2, 3])
test_set = np.array([[0, 1, 2], [1, 2, 3]])
resulting_set --> [[1, 2, 3], [0, 1, 2], [1, 2, 3]]

Q. How would you join the two arrays?
Note: Numpy library has been imported as np
Ans:
A) resulting_set = train_set.append(test_set)
B) resulting_set = np.concatenate([train_set, test_set])
C) resulting_set = np.vstack([train_set, test_set])
D) None of these

Solution: (C)
Both option A and B would do horizontal stacking, but we would like to have vertical stacking. So option C is correct

Question Context 10

Suppose you are tuning hyperparameters of a random forest classifier for the Iris dataset.

Sepal_length	Sepal_width	Petal_length	Petal_width	Species
4.6	3.2	1.4	0.2	Iris-setosa

5.3	3.7	1.5	0.2	Iris-setosa
5.0	3.3	1.4	0.2	Iris-setosa
7.0	3.2	4.7	1.4	Iris-versicolor
6.4	3.2	4.5	1.5	Iris-versicolor

Q. What would be the best value for "random_state (Seed value)"?
Ans:
A) np.random.seed(1)
B) np.random.seed(40)
C) np.random.seed(32)

D) Can't say

Solution: (D)
There is no best value for seed. It depends on the data.

Question Context 10

While reading a csv file with numpy, you want to automatically fill missing values of column "Date_Of_Joining" with date "01/01/2010".

Name	Age	Date_Of_Joining	Total_Experience
Andy	20	01/02/2013	0
Mandy	30	01/05/2014	10
Sandy	10		0
Bandy	40	01/10/2009	20

Q. Which command will be appropriate to fill missing value while reading the file with numpy?

Note: numpy has been imported as np
Ans:
A) filling_values = ("-", 0, 01/01/2010, 0)
temp = np.genfromtxt(filename, filling_values=filling_values)
B) filling_values = ("-", 0, 01/01/2010, 0)
temp = np.loadtxt(filename, filling_values=filling_values)
C) filling_values = ("-", 0, 01/01/2010, 0)
temp = np.gentxt(filename, filling_values=filling_values)
D) None of these

Solution: (A)

Option A is correct

Q. How would you import a decision tree classifier in sklearn?
Ans:
A) from sklearn.decision_tree import DecisionTreeClassifier
B) from sklearn.ensemble import DecisionTreeClassifier

C) from sklearn.tree import DecisionTreeClassifier
D) None of these

Solution: (C)
Option C is correct

13) You have uploaded the dataset in csv format on google spreadsheet and shared it publicly. You want to access it in python, how can you do this?

Ans: Note: Library StringIO has been imported as StringIO.
A)
link = https://docs.google.com/spreadsheets/d/...source = StringIO.StringIO(requests.get(link).content))
data = pd.read_csv(source)
B)
link = https://docs.google.com/spreadsheets/d/...source = StringIO(request.get(link).content))
data = pd.read_csv(source)
C)
link = https://docs.google.com/spreadsheets/d/...source = StringIO(requests.get(link).content))
data = pd.read_csv(source)
D) None of these
Solution: (A)
Option A is correct

Question Context 14

Imagine, you have a dataframe train file with 2 columns & 3 rows, which is loaded in pandas.

import pandas as pd
train = pd.DataFrame({'id':[1,2,4],'features':[["A","B","C"],["A","D","E"],["C","D","F"]]})
Now you want to apply a lambda function on "features" column:
train['features_t'] = train["features"].apply(lambda x: " ".join(["_".join(i.split(" ")) for i in x]))

Q. What will be the output of following print command?
Ans: print train['features_t']
A)
0 A B C
1 A D E
2 C D F
B)
0 AB
1 ADE
2 CDF
C) Error
D) None of these

Solution: (A)
Option A is correct

Question Context 15

We have a multi-class classification problem for predicting quality of wine on the basis of its attributes. The data is loaded in a dataframe "df"

	fixed acidity	volatile acidity	citric acid	residual sugar	chlorides	free sulfur dioxide	total sulfur dioxide	density	pH	sulphates	Alcohol	quality
0	7.4	0.70	0.00	1.9	0.076	11	34	0.9978	3.51	0.56	9.4	5
1	7.8	0.88	0.00	2.6	0.098	25	67	0.9968	3.20	0.68	9.8	5
2	7.8	0.76	0.04	2.3	0.092	15	54	0.9970	3.26	0.65	9.8	5
3	11.2	0.28	0.56	1.9	0.075	17	60	0.9980	3.16	0.58	9.8	6
4	7.4	0.70	0.00	1.9	0.076	11	34	0.9978	3.51	0.56	9.4	5

The quality column currently has values 1 to 10, but we want to substitute this by a binary classification problem. You want to keep the threshold for classification to 5, such that if the class is greater than 5, the output should be 1, else output should be 0.

Q. Which of the following codes would help you perform this task?

Note: Numpy has been imported as np and dataframe is set as df.

Ans:
A)
```
Y = df[quality].values
Y = np.array([1 if y >= 6 else 0 for y in Y])
```
B)
```
Y = df[quality].values()
Y = np.array([0 if y >= 6 else 1 for y in Y])
```
C)
```
Y = df[quality]
Y = np.array([0 if y >= 6 else 1 for y in Y])
```
D)None of these

Solution: (A)
Option A is correct

Question Context 16

Suppose we make a dataframe as

```
df = pd.DataFrame(['ff', 'gg', 'hh', 'yy'],
          [24, 12, 48, 30],
           columns = ['Name', 'Age'])
```

Q. What is the difference between the two data series given below?

1. **df['Name'] and**
2. **df.loc[:, 'Name']**

Note: Pandas has been imported as pd
A) 1 is view of original dataframe and 2 is a copy of original dataframe.
B) 2 is view of original dataframe and 1 is a copy of original dataframe.
C) Both are copies of original dataframe.

D) Both are views of original dataframe

Solution: (B)
Option B is correct.

Question Context 17

Consider a function "fun" which is defined below:

```
def fun(x):
   x[0] = 5
   return x
```

Now you define a list which has three numbers in it.
g = [10,11,12]

Q. Which of the following will be the output of the given print statement:

```
print  fun(g), g
```

A) [5, 11, 12] [5, 11, 12]
B) [5, 11, 12] [10, 11, 12]
C) [10, 11, 12] [10, 11, 12]
D) [10, 11, 12] [5, 11, 12]

Solution: (A)
Option A is correct

Question Context 18

Sigmoid function is usually used for creating a neural network activation function. A sigmoid function is denoted as

```
def sigmoid(x):
  return (1 / (1 + math.exp(-x)))
```

Q. It is necessary to know how to find the derivatives of sigmoid, as it would be essential for backpropagation. Select the option for finding derivative?

Ans:
A)

```
import scipy
Dv = scipy.misc.derive(sigmoid)
```

B)

```
from sympy import *
x = symbol(x)
y = sigmoid(x)
Dv = y.differentiate(x)
```

C)

```
Dv = sigmoid(x) * (1 - sigmoid(x))
```

D) None of these

Solution: (C)
Option C is correct

Question Context 19

Suppose you are given a monthly data and you have to convert it to daily data.
For example,

ID	Electricity_Usage	Month
1	2000	1
2	20	2
3	4000	3
4	40	4

ID	Electricity_Usage	Date	Month
1	100	1	1
1	100	2	1
1	100	3	1
1	100	4	1
1	100	5	1

For this, first you have to expand the data for every month (considering that every month has 30 days)

Q. Which of the following code would do this?
Note: Numpy has been imported as np and dataframe is set as df.
Ans:
A) new_df = pd.concat([df]*30, index = False)
B) new_df = pd.concat([df]*30, ignore_index=True)
C) new_df = pd.concat([df]*30, ignore_index=False)
D) None of these

Solution: (B)
Option B is correct

Context: 20-22

Suppose you are given a dataframe df.
df = pd.DataFrame({'Click_Id':['A','B','C','D','E'],'Count':[100,200,300,400,250]})

20) Now you want to change the name of the column 'Count' in df to 'Click_Count'. So, for performing that action you have written the following code.
df.rename(columns = {'Count':'Click_Count'})

Q. What will be the output of print statement below?

Ans: print df.columns

Note: Pandas library has been imported as pd.
A) ['Click_Id', 'Click_Count']
B) ['Click_Id', 'Count']

C) Error
D) None of these

Solution: (B)
Option B is correct

Context: 20-22

Suppose you are given a data frame df.
df = pd.DataFrame({'Click_Id':['A','B','C','D','E'],'Count':[100,200,300,400,250]})

21) In many data science projects, you are required to convert a dataframe into a dictionary. Suppose you want to convert "df" into a dictionary such that 'Click_Id' will be the key and 'Count' will be the value for each key. Which of the following options will give you the desired result?
Note: Pandas library has been imported as pd
Ans:
A) set_index('Click_Id')['Count'].to_dict()
B) set_index('Count')['Click_Id'].to_dict()
C) We cannot perform this task since dataframe and dictionary are different data structures
D) None of these

Solution: (A)
Option A is correct

22) In above dataframe df. Suppose you want to assign a df to df1, so that you can recover original content of df in future using df1 as below.
df1 = df
Now you want to change some values of "Count" column in df.
df.loc[df.Click_Id == 'A', 'Count'] += 100

Q. Which of the following will be the right output for the below print statement?
Ans: print df.Count.values,df1.Count.values
Note: Pandas library has been imported as pd.
A) [200 200 300 400 250] [200 200 300 400 250]
B) [100 200 300 400 250] [100 200 300 400 250]
C) [200 200 300 400 250] [100 200 300 400 250]
D) None of these

Solution: (A)
Option A is correct

23) You write a code for preprocessing data, and you notice it is taking a lot of time. To amend this, you put a bookmark in the code so that you come to know how much time is spent on each code line. To perform this task, which of the following actions you would take?

1. **You put bookmark as time.sleep() so that you would know how much the code has "slept" literally**
2. **You put bookmark as time.time() and check how much time elapses in each code line**
3. **You put bookmark as datetime.timedelta(), so that you would find out differences of execution times**
4. **You copy whole code in an Ipython / Jupyter notebook, with each code line as a separate block and write magic function %%timeit in each block**

Ans:
A) 1 & 2
B) 1,2 & 3
C) 1,2 & 4
D) All of the above

Solution: (C)
Option C is correct

24) How would you read data from the file using pandas by skipping the first three lines?
Note: pandas library has been imported as pd In the given file (email.csv), the first three records are empty.

,,,
,,,
,,,
Email_Address,Nickname,Group_Status,Join_Year
aa@aaa.com,aa,Owner,2014
bb@bbb.com,bb,Member,2015
cc@ccc.com,cc,Member,2017
dd@ddd.com,dd,Member,2016
A) read_csv('email.csv', skip_rows=3)
B) read_csv('email.csv', skiprows=3)
C) read_csv('email.csv', skip=3)
D) None of these

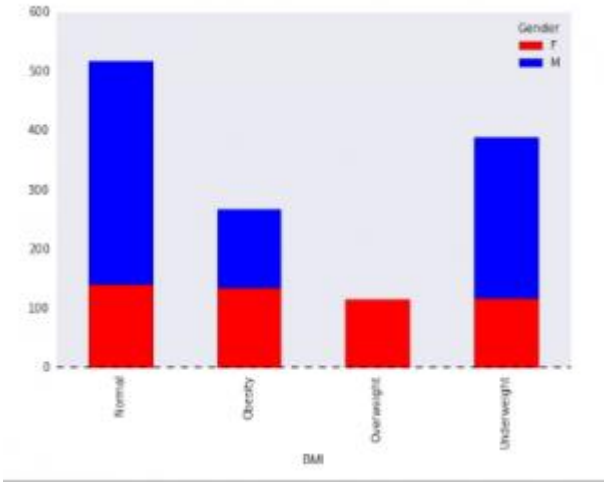
Solution: (B)
Option B is correct

25) What should be written in-place of "method" to produce the desired outcome?

Given below is dataframe "df":

EMPID	Gender	Age	Sales	BMI	Income
E001	M	34	123	Normal	350
E002	F	40	114	Overweight	450
E003	F	37	135	Obesity	169
E004	M	30	139	Underweight	189
E005	F	44	117	Underweight	183
E006	M	36	121	Normal	80
E007	M	32	133	Obesity	166
E008	F	26	140	Normal	120
E009	M	32	133	Normal	75
E010	M	36	133	Underweight	40

Now, you want to know whether BMI and Gender would influence the sales.
For this, you want to plot a bar graph as shown below:



The code for this is:
var = df.groupby(['BMI','Gender']).Sales.sum()

var.unstack().plot(kind='bar', ***method***, color=['red','blue'], grid=False)
A) stacked=True
B) stacked=False
C) stack=False
D) None of these

Solution: (A)
It's a stacked bar chart.

26) Suppose, you are given 2 list – City_A and City_B.
City_A = ['1','2','3','4']
City_B = ['2','3','4','5']
In both cities, some values are common. Which of the following code will find the name of all cities which are present in "City_A" but not in "City_B".
A) [i for i in City_A if i not in City_B]
B) [i for i in City_B if i not in City_A]
C) [i for i in City_A if i in City_B]
D) None of these

Solution: (A)
Option A is correct

Question Context 27
Suppose you are trying to read a file "temp.csv" using pandas and you get the following error.
Traceback (most recent call last):
File "<input>", line 1, in<module>
UnicodeEncodeError: 'ascii' codec can't encode character.

Q. Which of the following would likely correct this error?
Note: pandas has been imported as pd
Ans:
A) pd.read_csv("temp.csv", compression='gzip')

B) pd.read_csv("temp.csv", dialect='str')
C) pd.read_csv("temp.csv", encoding='utf-8')
D) None of these
Solution: (C)
Option C is correct, because encoding should be 'utf-8'

28) Suppose you are defining a tuple given below:
tup = (1, 2, 3, 4, 5)
Now, you want to update the value of this tuple at 2nd index to 10. Which of the following option will you choose?
A) tup(2) = 10
B) tup[2] = 10
C) tup{2} = 10
D) None of these
Solution: (D)
A tuple cannot be updated.

29) You want to read a website which has url as "www.abcd.org". Which of the following options will perform this task?

A) urllib2.urlopen(www.abcd.org)
B) requests.get(www.abcd.org)

C) Both A and B
D) None of these
Solution: (C)
Option C is correct

Question Context 30

Suppose you are given the below web page
html_doc = """
<!DOCTYPE html>
<htmllang="en">
<head>
<metacharset="utf-8">
<metaname="viewport" content="width=device-width">
<title>udacity/deep-learning: Repo for the Deep Learning Nanodegree Foundations program.</title>
<linkrel="search" type="application/opensearchdescription+xml" href="/opensearch.xml" title="GitHub">
<linkrel="fluid-icon" href="https://github.com/fluidicon.png" title="GitHub">
<metaproperty="fb:app_id" content="1401488693436528">
<linkrel="assets" href="https://assets-cdn.github.com/">
...
"""

30) To read the title of the webpage you are using BeautifulSoup. What is the code for this?
Hint: You have to extract text in title tag
Ans:

A. from bs4 import BeautifulSoup
   soup =BeautifulSoup(html_doc,'html.parser')
   print soup.title.name
B. from bs4 import BeautifulSoup
   soup =BeautifulSoup(html_doc,'html.parser')
   print soup.title.string

C. from bs4 import BeautifulSoup
soup=BeautifulSoup(html_doc,'html.parser')
print soup.title.get_text
D. None of these

Solution: (B)
Option B is correct

Question Context 31

Imagine, you are given a list of items in a DataFrame as below.
D = ['A','B','C','D','E','AA','AB']
Now, you want to apply label encoding on this list for importing and transforming, using LabelEncoder.
from sklearn.preprocessing import LabelEncoder
le = LabelEncoder()

Q. What will be the output of the print statement below ?

print le.fit_transform(D)
A. array([0, 2, 3, 4, 5, 6, 1])
B. array([0, 3, 4, 5, 6, 1, 2])
C. array([0, 2, 3, 4, 5, 1, 6])
D. Any of the above

Solution: (D)
Option D is correct

Q. Which of the following will be the output of the below print statement?
Ans: print df.val == np.nan
Assume, you have defined a data frame which has 2 columns.
import numpy as np
df = pd.DataFrame({'Id':[1,2,3,4],'val':[2,5,np.nan,6]})
A) 0 False
1 False
2 False
3 False
B) 0 False
1 False
2 True
3 False
C) 0 True
1 True
2 True
3 True
D) None of these

Solution: (A)
Option A is correct

Q. Suppose the data is stored in HDFS format and you want to find how the data is structured. For this, which of the following command would help you find out the names of HDFS keys?

Note: HDFS file has been loaded by h5py as hf.

A) hf.key()
B) hf.key
C) hf.keys()
D) None of these

Solution: (C)
Option C is correct

Question Context 34

You are given reviews for movies below:

reviews = ['movie is unwatchable no matter how decent the first half is . ', 'somewhat funny and well paced action thriller that has jamie foxx as a hapless fast talking hoodlum who is chosen by an overly demanding', 'morse is okay as the agent who comes up with the ingenious plan to get whoever did it at all cost .']

Your task is to find sentiments from the review above. For this, you first write a code to find count of individual words in all the sentences.

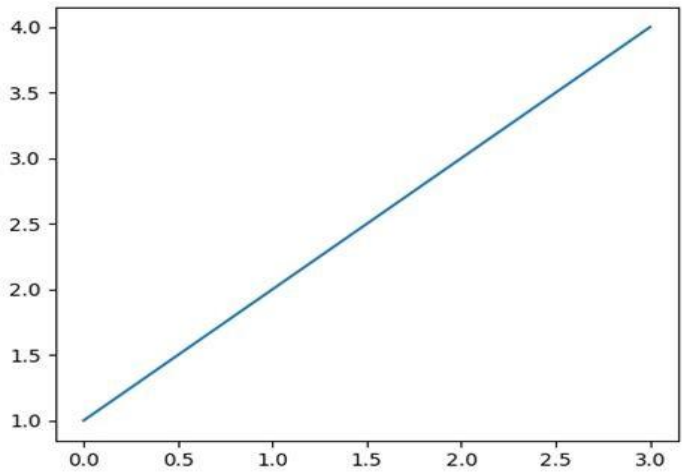
```
counts = Counter()

for i in range(len(reviews)):
   for word in reviews[i].split(value):
      counts[word] += 1
```

Q. What value should we split on to get individual words?
Ans:

A. ' '
B. ','
C. '.'
D. None of these

Solution: (A)
Option A is correct

Q. How to set a line width in the plot given below?



For the above graph, the code for producing the plot was

```
import matplotlib.pyplot as plt
plt.plot([1,2,3,4])
plt.show()
```

A. In line two, write plt.plot([1,2,3,4], width=3)
B. In line two, write plt.plot([1,2,3,4], line_width=3
C. In line two, write plt.plot([1,2,3,4], lw=3)
D. None of these

Solution: (C)
Option C is correct

Q. How would you reset the index of a dataframe to a given list? The new index is given as: new_index=['Safari','Iceweasel','Comodo Dragon','IE10','Chrome']
Note: df is a pandas dataframe

	http_status	response_time
Firefox	200	0.04
Chrome	200	0.02
Safari	404	0.07
IE10	404	0.08
Konqueror	301	1.00

A) df.reset_index(new_index,)
B) df.reindex(new_index,)
C) df.reindex_like(new_index,)
D) None of these

Solution: (A)
Option A is correct

Q. Determine the proportion of passengers survived based on their passenger class.

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1	0	3	Braund, Mr. Owen Harris	Male	22.0	1	0	A/5 21171	7.2500	NaN	S

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th…	Female	38.0	1	0	PC 17599	71.2833	C85	C
2	3	1	3	Heikkinen, Miss. Laina	Female	26.0	0	0	STON/O2. 3101282	7.9250	NaN	S
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	Female	35.0	1	0	113803	53.1000	C123	S
4	5	0	3	Allen, Mr. William Henry	Male	35.0	0	0	373450	8.0500	NaN	S

A. crosstab(df_train['Pclass'], df_train['Survived'])
B. proportion(df_train['Pclass'], df_train['Survived'])
C. crosstab(df_train['Survived'], df_train['Pclass'])
D. None of these

Solution: (A)
Option A is correct

Q. You want to write a generic code to calculate n-gram of the text. The 2-gram of this sentence would be [["this, "is"], ["is", "a"], ["a, "sample"], ["sample", "text"]]

Which of the following code would be correct?

For a given a sentence: 'this is a sample text'.

A.
```
def generate_ngrams(text, n):
words = text.split('\n')
output = [] for i in range(len(words)-n+1):
append(words[i+1:i+n])
return output
```

B.
```
def generate_ngrams(text, n):
words = text.split()
output = [] for i in range(len(words)-n+1):
```

append(words[i:i+n])
return output

C. def generate_ngrams(text, n):
words = text.split()
output = [] for i in range(len(words)-n+1):
append(words[i+1:i+n])
return output

D. None of these

Solution: (B)
Option B is correct

Q. Which of the following code will export dataframe (df) in CSV file, encoded in UTF-8 after hiding index & header labels.

A. df_1.to_csv('../data/file.csv',encoding='utf-8',index=True,header=False)
B. df_1.to_csv('../data/file.csv',encoding='utf-8',index=False,header=True)
C. df_1.to_csv('../data/file.csv',encoding='utf-8',index=False,header=False)
D. None of these

Solution: (C)
Option C is correct

Q. Which of the following is a correct implementation of mean squared error (MSE) metric?

Note: numpy library has been imported as np.

A. def MSE(real_target, predicted_target):
return np.mean((np.square(real_target) – np.square(predicted_target)))
B. def MSE(real_target, predicted_target):
return np.mean((real_target – predicted_target)**2)
C. def MSE(real_target, predicted_target):
return np.sqrt(np.mean((np.square(real_target) – np.square(predicted_target))))
D. None of the above

Solution: (B)
Option B is correct