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Python
Interview Questions

Q1. What is the purpose of "is", "not" and "in" operators?

Operators are referred to as special functions that take one or more values (operands) and produce a corresponding result.

- is: returns the true value when both the operands are true (Example: "x" is 'x')
- not: returns the inverse of the boolean value based upon the operands (example:"1" returns "0" and vice-versa.

In: helps to check if the element is present in a given Sequence or not.

Q2. Whenever Python exits, why isn't all the memory de-allocated?

- 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, the memory is not always de-allocated or freed.
- It is not possible to de-allocate those portions of memory that are reserved by the C library.
- On exit, because of having its own efficient clean up mechanism, Python will try to de-allocate every object.

Q3. How to remove values to a python array?

Elements can be removed from a python array by using pop() or remove() methods.

pop(): This function will return the removed element .

remove():It will not return the removed element.

Consider the below example :

x=arr.array('d', [8.1, 2.4, 6.8, 1.1, 7.7, 1.2, 3.6])

print(x.pop())

print(x.pop(3))

x.remove(8.1)

print(x)

Q4. Why would you use NumPy arrays instead of lists in Python?

NumPy arrays provide users with three main advantages as shown below:

- NumPy arrays consume a lot less memory, thereby making the code more efficient.

- NumPy arrays execute faster and do not add heavy processing to the runtime.
- NumPy has a highly readable syntax, making it easy and convenient for programmers.

Q5. What is polymorphism in Python?

Polymorphism is the ability of the code to take multiple forms. Let's say, if the parent class has a method named XYZ then the child class can also have a method with the same name XYZ having its own variables and parameters.

Q6. Define encapsulation in Python?

Encapsulation in Python refers to the process of wrapping up the variables and different functions into a single entity or capsule. The Python class is the best example of encapsulation in python.

Q7. What advantages do NumPy arrays offer over (nested) Python lists?

Nested Lists:

- Python lists are efficient, general-purpose containers that support efficient operations like
insertion, appending, deletion and concatenation.

- The limitations of lists are that they don't support "vectorized" operations like element wise addition and multiplication, and the fact that they can contain objects of differing types means that Python must store the data type information for every element, and must execute type dispatching code when operating on each element.

Numpy:

- NumPy is more efficient and more convenient as you get a lot of vector and matrix operations for free, this helps avoid unnecessary work and complexity of the code. NumPy is also efficiently implemented when compared to nested lists.
- NumPy array is faster and contains a lot of built-in functions which will help in FFTs, convolutions, fast searching, linear algebra, basic statistics, histograms, etc.

Q8. What is the lambda function in Python?

A lambda function is an anonymous function (a function that does not have a name) in Python. To define anonymous functions, we use the 'lambda' keyword instead of the 'def' keyword, hence the name 'lambda function'. Lambda functions can have any number of arguments but only one statement.

For example:

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l = lambda (x,y) : x*y

print(a(5, 6))

Q9. What is the difference between append() and extend() methods?

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

The primary differentiation between the append() and extend() methods in Python is that append() is used to add a single element to the end of a list. In contrast, open () is used to append multiple aspects, such as another list or an iterable, to the end of a list.

Q10. How does Python Flask handle database requests?

Ans- Flask supports a database-powered application (RDBS). Such a system requires creating a schema, which needs piping the schema. SQL file into the sqlite3 command. Python developers need to install the sqlite3 command to create or initiate the database in Flask.

Flask allows to request for a database in three ways:

- before_request(): They are called before a request and pass no arguments.

- after_request(): They are called after a request and pass the response that will be sent to the client.
- teardown_request(): They are called in a situation when an exception is raised and responses are not guaranteed. They are called after the response has been constructed. They are not allowed to modify the request, and their values are ignored.

Q11. How is multi-threading achieved in Python?

Ans- Python has a multi-threading package but commonly not considered a good practice to use it as it results in increased code execution time.

- Python has a constructor called the Global Interpreter Lock (GIL). The GIL ensures that only one of your 'threads' can execute at one time. The process makes sure that a thread acquires the GIL, does work, then passes the GIL onto the next thread.
- This occurs almost instantaneously, giving the illusion of parallel execution to the human observer. However, the threads execute sequentially, taking turns utilizing the same CPU core.

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Q12. What is slicing in Python?

Ans- Slicing is a technique employed to extract a specific range of elements from sequential data types, such as lists, strings, and tuples. Slicing is beneficial and easy to extract out elements. It requires a : (colon) which separates the start index and end index of the field. All the data sequence types, list or tuple, allows users to use slicing to get the needed elements. Although we can get elements by specifying an index, we get only a single element. Whereas, using slicing, we can get a group or appropriate range of needed elements.

Q13. What is functional programming? Does Python follow a functional programming style? If yes, list a few methods to implement functionally oriented programming in Python.

Functional programming is a coding style where the main source of logic in a program comes from functions.

Incorporating functional programming in our codes means writing pure functions.

Pure functions are functions that cause little or no changes outside the scope of the function. These changes are referred to as side effects. To reduce side effects, pure functions are used, which makes the code easy-to-follow, test, or debug.

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Q14. What is monkey patching in Python?

Ans - Monkey patching is the term used to denote modifications that are done to a class or a module during runtime. This can only be done as Python supports changes in the behaviour of the program while being executed.

The following is an example, denoting monkey patching in Python:

```
# monkeyy.py

class X:

    def func(self):

        print("func() is being called")
```

Q15. What is pandas?

Pandas is an open source python library which supports data structures for data based operations associated with data analyzing and data manipulation . Pandas, with its rich sets of features, fits in every role of data operation, whether it be related to implementing

different algorithms or for solving complex business problems. Pandas helps to deal with a number of files in performing certain operations on the data stored by files.

Q16. What are dataframes?

Ans- A dataframes refers to a two dimensional mutable data structure or data aligned in the tabular form with labelled axes(rows and column).

Syntax:

pandas.DataFrame(data, index, columns, dtype)

data: It refers to various forms like ndarray, series, map, lists, dict, constants and can take other DataFrame as Input.

index: This argument is optional as the index for row labels will be automatically taken care of by pandas library.

columns: This argument is optional as the index for column labels will be automatically taken care of by pandas library.

Dtype: refers to the data type of each column.

Q17. What is regression?

Regression is termed as a supervised machine learning algorithm technique which is used to find the correlation between variables. It helps predict the value of the dependent variable(y) based upon the independent variable (x). It is mainly used for prediction, time series modelling , forecasting, and determining the causal-effect relationship between variables.

Scikit library is used in python to implement the regression and all machine learning algorithms.

There are two different types of regression algorithms in machine learning :

Linear Regression: Used when the variables are continuous and numeric in nature.

Logistic Regression: Used when the variables are continuous and categorical in nature.

Q18. Write a program in Python to check if a number is prime?

Ans-

```
In [28]: num = 13

if num > 1:
    for i in range(2, int(num/2)+1):
        if (num % i) == 0:
            print(num, "is not a prime number")
            break
    else:
        print(num, "is a prime number")
else:
    print(num, "is not a prime number")

13 is a prime number
```

Q19. Write a Program to print ASCII Value of a character in python?

Ans-

```
In [30]: x= 'a'

# print the ASCII value of assigned character stored in x

print(" ASCII value of '" + x + "' is", ord(x))

 ASCII value of 'a' is 97
```

Q20. Write a sorting algorithm for a numerical dataset in Python.

Ans- my_list = ["8", "4", "3", "6", "2"]

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

```
my_list.sort()


print (my_list)
```