**OOP QUESTION**

1-Mention Differences between class variable and object variable

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| --- | --- |
| CLASS VARIABLE | OBJECT VARIABLE |
| Shared among all instances | Unique to each instance |
| Defined outside instance methods | Defined within instance methods using ‘Self’ |
| Accessed via class name or instances | Accessed via instance name |
| Initialized directly within class definition | Initialized within \_\_init\_\_method |

2-আপনি কিভাবে একটি পাইথন dictionary থেকে সবগুলো key লিস্ট আকারে পেতে পারেন?  
কোন ফাংশন ব্যবহার করে?

Ans : keys()

3-

What is the difference between / and // in Python?

Ans : first one is normal division and the second one is floor division

4-

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

Ans: The common built-in data types in Python include:

int (integer)

float (floating-point number)

str (string)

bool (boolean)

list (mutable sequence)

tuple (immutable sequence)

dict (dictionary, also known as a mapping)

set (mutable unordered collection of unique elements)

frozenset (immutable unordered collection of unique elements)

5- Explain the use of the \_\_init\_\_ method in Python classes

Ans:

The \_\_init\_\_ method in Python classes is a special method that is automatically called when a new instance of the class is created. It is used to initialize the object's attributes

6-

What is self in Python?

In Python, self is a conventionally used parameter name that refers to the current instance of a class. It allows access to the attributes and methods of the class within its own scope.

7-

Explain the difference between append() and extend() methods for lists  
Ans:

The append() method adds a single element to the end of a list, while the extend() method adds multiple elements, such as another list, to the end of the original list.

8-

What is a lambda function?  
Please provide an Example

ANS: A lambda function in Python is an anonymous function defined using the lambda keyword. It can take any number of arguments but can only have one expression.

# Lambda function to calculate the square of a number

square = lambda x: x \*\* 2

# Using the lambda function

result = square(5)

print(result) # Output: 25

9-

What does [::-1} do?

Ans:

[::-1] reverses the elements of a sequence like a list, tuple, or string in Python.

10- If a function doesn’t have a return statement, is it valid in Python?

Ans:Yes it is valid.If a function doesn’t return statement then it will return just None

11- Can you tell us what you understand about method overriding and method overloading?

Method overriding involves providing a new implementation for a method in a subclass that already exists in the superclass, whereas method overloading involves defining multiple methods in a class with the same name but different parameters

12- What is Hybrid Inheritance in python OOP?

Hybrid inheritance refers to a combination of multiple types of inheritance in Python

13- Can you name some characteristics of abstract classes?

Abstract classes cannot be instantiated directly

They may contain abstract methods, which are defined but not implemented in the abstract class itself.

Subclasses of abstract classes must implement all abstract methods defined in the base abstract class.

Abstract classes may also contain concrete methods, which have a complete implementation.

Abstract classes are typically used to define a common interface for a group of related classes.

They provide a way to enforce a particular method structure across multiple subclasses.s

14-

What do you understand about constructor chaining in oop python ?

Constructor chaining in object-oriented programming refers to the process of calling constructors of parent classes from the constructor of a subclass