**What is an Interpreted language?**

An interpreted language executes code line by line directly from the source code, without compiling it into machine code first. This allows for easier debugging and quick testing. Examples include Python, JavaScript, R, PHP, and Ruby. However, interpreted languages can be slower than compiled languages because they don't convert code to machine language beforehand.

### What is Python? What are the benefits of using Python

Python is a high-level, interpreted, general-purpose programming language known for its simple, readable syntax. It supports objects, modules, threads, exception handling, and automatic memory management, making it versatile for various applications.

**Benefits:**

* **Easy to Learn:** Simple and readable syntax reduces maintenance costs.
* **Versatile:** Suitable for scripting and general-purpose programming.
* **Open-Source:** Free to use and supports third-party packages for modularity and code reuse.
* **Rapid Development:** High-level data structures and dynamic typing/binding support quick application development and deployment.

What is the difference between list and tuple?

* The list structure is dynamic, and readily changed whereas the tuple structure is static and cannot be changed. This means that the tuple is generally faster than the list. Lists are denoted by square brackets and tuples are denoted with parenthesis.
* Lists are mutable Tuples are immutable
* Lists consume more memory Tuple consumes less memory as compared to the list
* Lists have several built-in methods Tuple does not have many built-in methods.

### What is pass in Python?

### The pass keyword in python is a null operation, meaning it does nothing. It is used to fill empty blocks of code that are syntactically required but not yet implemented. Without pass, such empty blocks would cause errors.

### What are modules and packages in Python?

### Modules are individual python files containing code, while packages are directories that contain one or more modules. Modules help organize related code into separate files, while packages organize modules hierarchically and provide a way to distribute and import related code as a single entity. They both serve to structure and manage code in python projects.

### What are global, protected and private attributes in Python?

### Public Access Modifier: The members of a class that are declared public are easily accessible from any part of the program. All data members and member functions of a class are public by default.

### Protected Access Modifier: The members of a class that are declared protected are only accessible to a class derived from it. All data members of a class are declared protected by adding a single underscore ‘\_’ symbol before the data members of that class.

### Private Access Modifier: The members of a class that are declared private are accessible within the class only, the private access modifier is the most secure access modifier. Data members of a class are declared private by adding a double underscore ‘\_\_’ symbol before the data member of that class.

### What is the use of self in Python?

**Self**is used to represent the instance of the class. With this keyword, you can access the attributes and methods of the class in python.

### What is the difference between Python Arrays and lists?

Python Array:-

* Arrays in python can only contain elements of same data types
* Python arrays are implemented in C language.
* Python array consumes far less memory than lists.

Python Lists:-

* Lists in python can contain elements of different data.
* List are implemented in python language.
* Python list consume large memory.

### What is a Class?

A **class** is a building block of Object-Oriented Programs. It is a user-defined data type that contains the data members and member functions that operate on the data members. It is like a blueprint or template of objects having common properties and methods.

### ****What is an Object?****

An **object** is an instance of a class. Data members and methods of a class cannot be used directly. We need to create an object (or instance) of the class to use them. In simple terms, they are the actual world entities that have a state and behavior.

**What are decorators in python?**

Decorators is a function that takes another function as an argument and returns a function.

**What are generators in python?**

Generator in python is a function that returns an iterator using yield keyword.

**What is Slicing in python:-**

**Slicing in Python** is a technique used to access a subset of elements from a sequence, such as a list, tuple, or string. It allows you to specify a start, stop, and step index to create a new sequence.

**my\_list = [0, 1, 2, 3, 4, 5]**

**print(my\_list[1:4]) # Output: [1, 2, 3]**

**print(my\_list[:3]) # Output: [0, 1, 2]**

**print(my\_list[2:]) # Output: [2, 3, 4, 5]**

**print(my\_list[::2]) # Output: [0, 2, 4]**

**What is indexing in python.**

Indexing in python is used to access individual element from the sequence such as list, tuple and string.

my\_list = [10, 20, 30, 40, 50]

# Accessing elements by index

print(my\_list[0]) # Output: 10

print(my\_list[2]) # Output: 30

print(my\_list[4]) # Output: 50

Python also supports negative indexing, where -1 refers to the last element, -2 to the second last element, and so on.

### IndexError:

Accessing an index that is out of range will result in an IndexError.

**List Comprehension:-**

List comprehension is a technique which is used to create a new list based on the values of an existing list.

**squares = [x\*\*2 for x in range(10)]**

**print(squares) # Output: [0, 1, 4, 9, 16, 25, 36, 49, 64, 81]**

we can add an optional condition to filter items.

**evens = [x for x in range(10) if x % 2 == 0]**

**print(evens) # Output: [0, 2, 4, 6, 8]**

**Dictionary Comprehension:-**

**Dictionary Comprehension is a technique which is used to create a new dictionary based on the values of an existing dictionary.**

**squares = {x: x\*\*2 for x in range(10)}**

**print(squares) # Output: {0: 0, 1: 1, 2: 4, 3: 9, 4: 16, 5: 25, 6: 36, 7: 49, 8: 64, 9: 81}**

You can add an optional condition to filter items.

**even\_squares = {x: x\*\*2 for x in range(10) if x % 2 == 0}**

**print(even\_squares) # Output: {0: 0, 2: 4, 4: 16, 6: 36, 8: 64}**

Create a dictionary mapping words to their lengths:

**sentence = "Dictionary comprehensions are very useful"**

**word\_lengths = {word: len(word) for word in sentence.split()}**

**print(word\_lengths) # Output: {'Dictionary': 10, 'comprehensions': 14, 'are': 3, 'very': 4, 'useful': 6}**

What is the difference between parameter and argument in python.

# Function definition with parameters x and y

def multiply(x, y):

return x \* y

# Function call with arguments 4 and 5

result = multiply(4, 5)

print(result) # Output: 20

**Q :- Public**

Public variables and methods are those that can be accessed by any part of the program. In Python, variables and methods are public by default, and they do not require any special keyword to be declared as public.

**Q :- Private**

Private variables and methods are those that can only be accessed within the class. In Python, private variables and methods are declared by prefixing them with double underscores (\_\_).

**Q :- Protected**

Protected variables and methods are those that can be accessed within the class and its subclasses. In Python, protected variables and methods are declared by prefixing them with a single underscore (\_).

What is \_\_init\_\_() in python?

In Python, \_\_init\_\_ is a special method called a constructor. It is automatically invoked when an instance of a class is created. The primary purpose of \_\_init\_\_ is to initialize the object's attributes with user-provided values or default values.