What is Object-Oriented Programming (OOP)?

a) A programming paradigm based on objects and classes

b) A way to write procedural code

c) A method for defining variables in Python

d) A way to create functions in Python

In Python, what is a class?

a) A blueprint for creating objects

b) A built-in Python function

c) A special data type

d) A module for organizing code

What is an object in Python?

a) A reserved keyword

b) An instance of a class

c) A variable with a numeric value

d) A built-in Python function

Which principle of OOP refers to the ability of an object to take on many forms?

a) Encapsulation

b) Inheritance

c) Polymorphism

d) Abstraction

In Python, which keyword is used to create a new instance of a class?

a) new

b) create

c) instance

d) self

What is encapsulation in OOP?

a) The ability of a class to inherit from multiple classes

b) The bundling of data and methods that operate on that data into a single unit

c) The process of creating a new class based on an existing class

d) The ability to hide the implementation details of a class

What does inheritance allow you to do in Python?

a) Combine multiple classes into a single class

b) Create instances of a class

c) Acquire properties and behaviors from another class

d) Define abstract methods

Which keyword in Python is used to call a superclass's constructor from a subclass?

a) superclass

b) base

c) super

d) parent

What is the purpose of the self parameter in Python class methods?

a) It refers to the superclass.

b) It is used to call other methods in the same class.

c) It represents the current instance of the class.

d) It is a reserved keyword and has no specific purpose.

What is the main advantage of using OOP in Python?

a) It reduces code complexity.

b) It improves memory management.

c) It eliminates the need for functions.

d) It allows for shorter variable names.

What is a data structure in Python?

a) A built-in function

b) A way to store data in Python

c) A programming language

d) A type of loop

Which data structure in Python is used to store a collection of elements, and allows duplicates?

a) List

b) Set

c) Tuple

d) Dictionary

Which data structure is best suited for implementing a stack in Python?

a) List

b) Tuple

c) Set

d) Dictionary

In Python, which data structure is used to implement a queue?

a) List

b) Tuple

c) Set

d) Deque

Which data structure in Python is an ordered collection of elements with a key-value pair?

a) List

b) Tuple

c) Set

d) Dictionary

What is the time complexity of searching for an element in a set in Python?

a) O(1)

b) O(log n)

c) O(n)

d) O(n log n)

Which data structure in Python is used to implement a dynamic array?

a) List

b) Tuple

c) Set

d) Dictionary

What is the primary advantage of using a linked list over an array?

a) Constant-time access to elements

b) Faster insertion and deletion operations

c) Smaller memory footprint

d) Built-in sorting functions

Which data structure is used to implement a priority queue in Python?

a) List

b) Tuple

c) Set

d) Heap

In Python, what is the purpose of the collections module?

a) To perform mathematical operations

b) To work with data structures and containers

c) To create graphical user interfaces

d) To define custom classes

* Fibonacci Sequence: Write a Python function to generate the Fibonacci sequence up to a specified number of terms.
* Palindrome Checker: Create a Python function to check if a given string is a palindrome (reads the same forwards and backwards).
* Factorial Calculator: Write a Python function to calculate the factorial of a given number.
* Prime Number Checker: Create a Python function to check if a given number is prime.
* Reverse a String: Write a Python function that reverses a given string.
* Count Vowels and Consonants: Write a Python function to count the number of vowels and consonants in a string.
* Sum of Digits: Create a Python function that calculates the sum of the digits of a positive integer.