What is Object Oriented Programming and How does it differ from procedural programming?

Object Oriented Programming can be defined as programming model which is based on the concept of objects. Objects contain data in the form of attributes and code in the form of methods. While procedural can be defined as a programming model which is derived from structured programming. Procedures also known as routines, subroutines or functions which consists of computational steps.

Explain the principles of OOP and how they are implemented in Python. Describe the concepts of encapsulation, inheritance and polymorphism.

OOP is a programming that uses objects and classes. The main concepts is to bind the data and the functions that work on that together as a single unit so that no other part of the code can access this data.

Encapsulation:It describes the idea of wrapping data and the methods that work on the data within one unit. This puts the restrictions on accessing variables and methods directly and can prevent the accidental modification of the data.

Inheritance: It is the capability of one class to derive or inherit the properties from the another class. As parent children relationship.

Types of Inheritance: Single Inheritance, Multilevel Inheritance, Hierarchical Inheritance, Multiple Inheritance.

Polymorphism: It means having many forms.

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

Class method must have an extra first parameter in the method definition. It is the reference point as if we call a method of an object it will directly convert it to the class.

How does method overriding work in Python, and why is it useful?

Method Overriding allows us to redefine a method in a subclass or the derived class .When a method in a subclass has the same name, same parameters or same return type as a method in its super class, then the method in the subclass is said to override the method in the super class.

What is the difference between class and instance variables in Python?

A class variable is a variable that defines a particular property or attribute for as class. An instance variable is a variable whose value is specified to the instance and shared among different instances.

Discuss the concepts of Abstract classes and how they are implemented in Python

Abstract class can be considered a blueprint for other classes. It allows us to create a set of methods that must be created within any child classes built from the abstract class. A class that contains one or more abstract methods is called an abstract class. Abstract method is a method that has a declaration but does not have an implementation.

```
from abc import ABC, abstractmethod
```

```
Class Animal(ABC):
        Def move(self):
                pass
Class Human(Animal):
        Def move(self):
                print(“Walk”)
Class Snake(Animal):
        Def move(Self):
                print(“Crawl”)
Human.move()
Snake.move()
```

Output: Walk
Crawl

Explain the importance of the super() function in Python inheritance.
super() function is used to refer to the parent class or superclass. It allows us to call methods defined in the superclass from the subclass, enabling to extend and customize the functionality inherited from the parent class.

How does Python support multiple Inheritance and what challenges can arise from it?
Python supports multiple inheritance because it allows for greater flexibility in designing and organizing classes. It leads to complexities and potential issues - ambiguity.

What is a decorator in Python, and how can it be used in the context of OOP?
Decorators are a very powerful tool in Python as it allows programmers to modify the behavior of a function or class. Decorators allow us to wrap another function in order to extend the behavior of the wrapped function, without permanently modifying it.

```
Def shout(text):
        Return text.upper()
print(shout(“HELLO”)
Yell = shout
print(yell(“HELLO”)
```

Output:
HELLO
HELLO

What do you understand by Descriptive Statistics? Explain by Example.
The main purpose of descriptive statistics is to provide information about a dataset. It summaries the large amount of data into several useful bits of information.

What do you understand by Inferential Statistics? Explain by Example.

The main goal of inferential statistics is to discover some property or general pattern about a large group by studying a smaller group of people in the hopes that the results will generalize to the larger group.