What is Inheritance?

In this lesson, you will be introduced to Inheritance, a powerful concept in Object-Oriented Programming.

> **We'll cover the following** ^
>
> - Definition
> - The *IS A* Relationship
> - The Python Object class

Now that you are familiar with the concepts of *objects* and *classes*, let's discuss **inheritance** which is another key concept in *Object-Oriented Programming*.

Definition

Inheritance provides a way to create a new class from an existing class. The new class is a specialized version of the existing class such that it inherits all the *non-private* fields (*variables*) and *methods* of the existing class. The existing class is used as a starting point or as a *base* to create the new class.

The *IS A* Relationship

After reading the above definition, the next question that comes to your mind is *when do we use inheritance?* Well, the answer is that wherever we come across an **IS A** relationship between objects, we can use inheritance.

Square

IS A
Shape

Python

IS A
Programming Language

Car

IS A
Vehicle
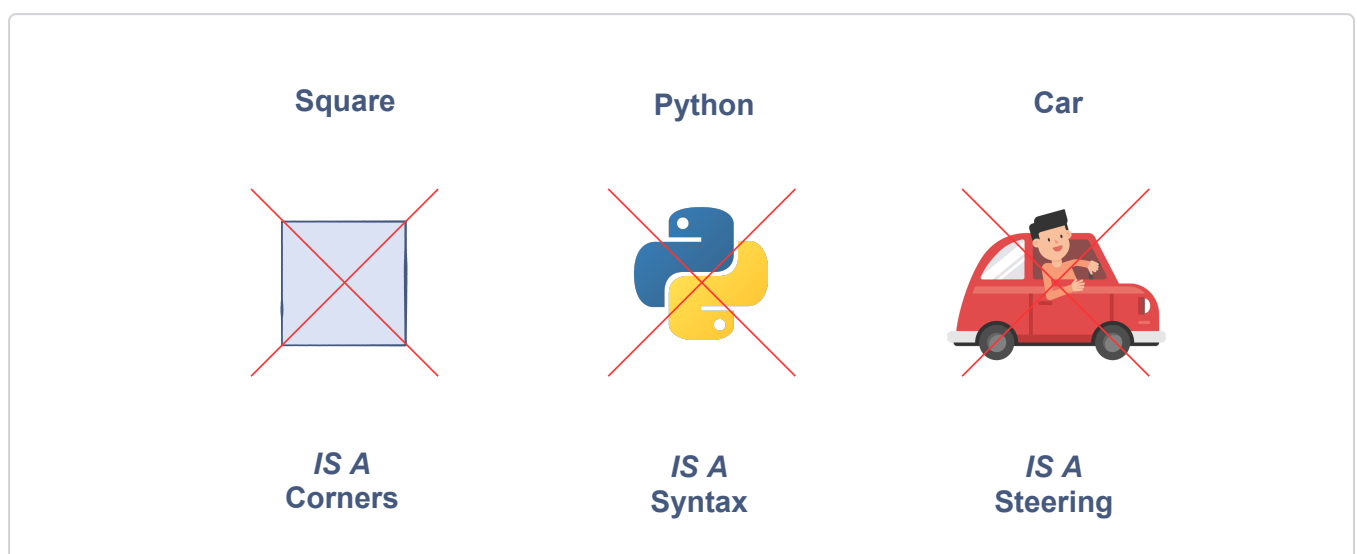
In the above illustration, we can see the objects have a *IS A* relationship between them. We can write it as:

- Square *IS A* shape
- Python *IS A* programming language
- Car *IS A* vehicle

So, from the above descriptions regarding *inheritance,* we can conclude that we can build new classes by extending *existing classes*.

Existing Class	Derived Class
Shape	Square
Programming Language	Python
Vehicle	Car

Let's find out where an *IS A* relationship doesn't exist.

Square   Python   Car

IS A Corners   *IS A* Syntax   *IS A* Steering

The above illustration shows that we cannot use inheritance whenever an *IS A* relationship doesn't exist between the classes.

The Python Object class

The primary purpose of object-oriented programming is to enable a programmer to model the *real-world objects* using a programming language.

In Python, whenever we create a `class`, it is, by default, a subclass of built-in Python `object class`. This makes it an excellent example of inheritance in Python. This class has very few properties and methods but does provide a strong basis for Object-Oriented Programming in Python.

Are things getting interesting? So, let's move to the next lesson in which we will discuss the syntax and terminologies related to inheritance.