A Brief Introduction

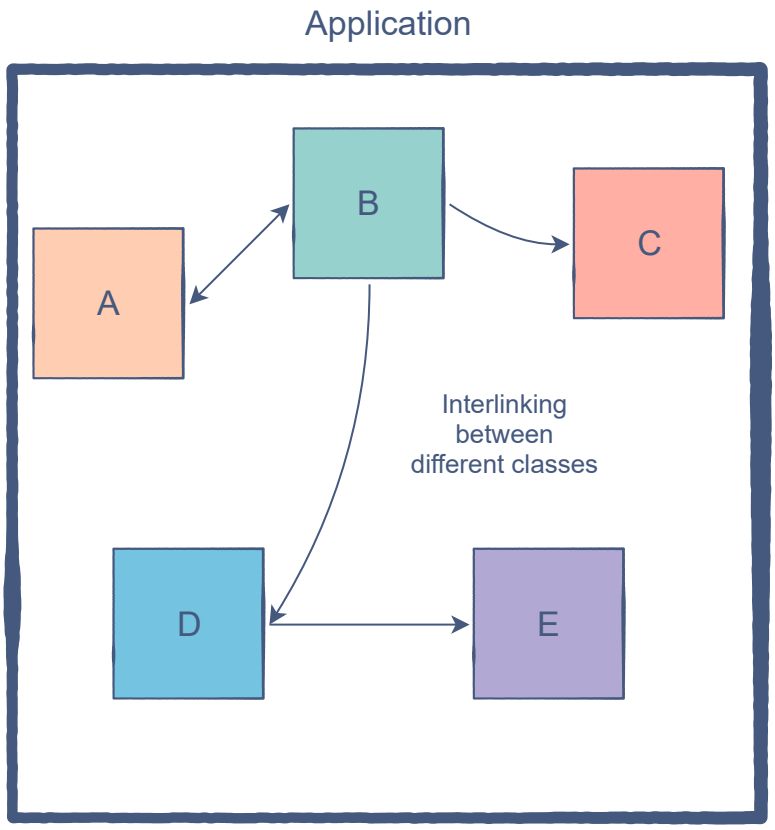
In this lesson, we'll get to know the different relationships between classes.

WE'LL COVER THE FOLLOWING

Interaction Between Classe Objects

By now, we've learned all we need to know about the definition and the behavior of a class. The concepts of **inheritance** and **polymorphism** taught us how to create dependent classes out of a base class. While inheritance represents a relationship between classes, there are situations where there are relationships between objects.

The next step for us is to use different class objects to design an application. This means that objects of independent classes would have to find a way to interact with each other.



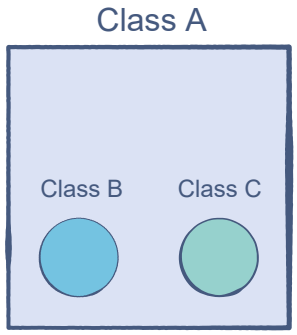
Let's discuss the classification of ways in which the objects of different classes can interact with each other.

Relationships Between Classes

There are three commonly used class relationships we need to know for now. We have studied the **IS A** relation in the Inheritance chapter. We'll study the other two below:

Part-of

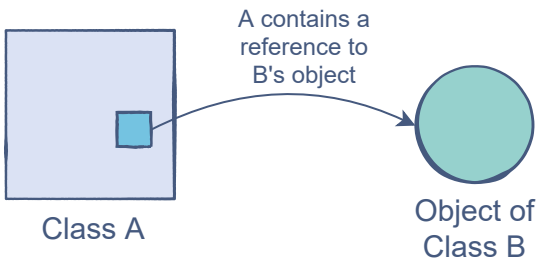
In this relationship, one class object is a **component** of another class' object. Given two classes, class A and class B, they are in a **part-of** relationship if the object of class A is a part of an instance of class B, or vice-versa.



Class A contains objects of Class B and C.

An instance of the component class(es) can only be created inside the containing class. In the example

to the right, *class B* and *class C* have their own implementations, but their objects are **part-of** the implementation of *Class A* and are only created once a class A object is created. Hence, part-of is a dependent relationship.



The object of class exists independent of A.

Has-a

This is a slightly less concrete relationship between two classes. *Class A* and *class B* hold a **has-a** relationship if one or both need the other's object to perform an operation, but both class objects can exist independently of each other.

This implies that a class **has-a** reference to an object of the other class but does not decide the lifetime of the other class's referenced object.

Association

In object-oriented programming, **association** is the common term used for both the **has-a** and **part-of** relationships but is not limited to these. When we say that two classes are associated with each other, this is a generic statement which means that we don't worry about the lifetime dependency between the objects of these classes. In the next couple of lessons, we will dive into the specialized forms of association: **aggregation** and **composition**.

Now that we've understood the relationships relevant to this section, let's start off with the first technique for relating objects in C#: aggregation.