Object Oriented Programming, Learning OOP Concepts (Class, Object, Inheritance, Polymorphism), Benefits and Application Methods

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Abstract. *When we learn programming, we will definitely come to the concept of object oriented programming (OOP). For many people, this stage seems a bit incomprehensible and complicated. Actually it is not.*

To understand OOP, let's first look at classical programming. The point is that the first computers and programs were aimed at solving mathematical problems. Such programs received some data from the user, performed various arithmetic operations following a strict sequence, and returned the user's expected result at the end of the program. That is why such programs are called linear or sequential programs.

Keywords: *object, oop, programming, inheritance, containers.*

Enter.

WHAT IS AN OBJECT?

In object-oriented programming, interdependent variables and functions are combined into one container, and such containers are called objects. Variables belonging to an object are called its properties, and functions related to it are called methods.
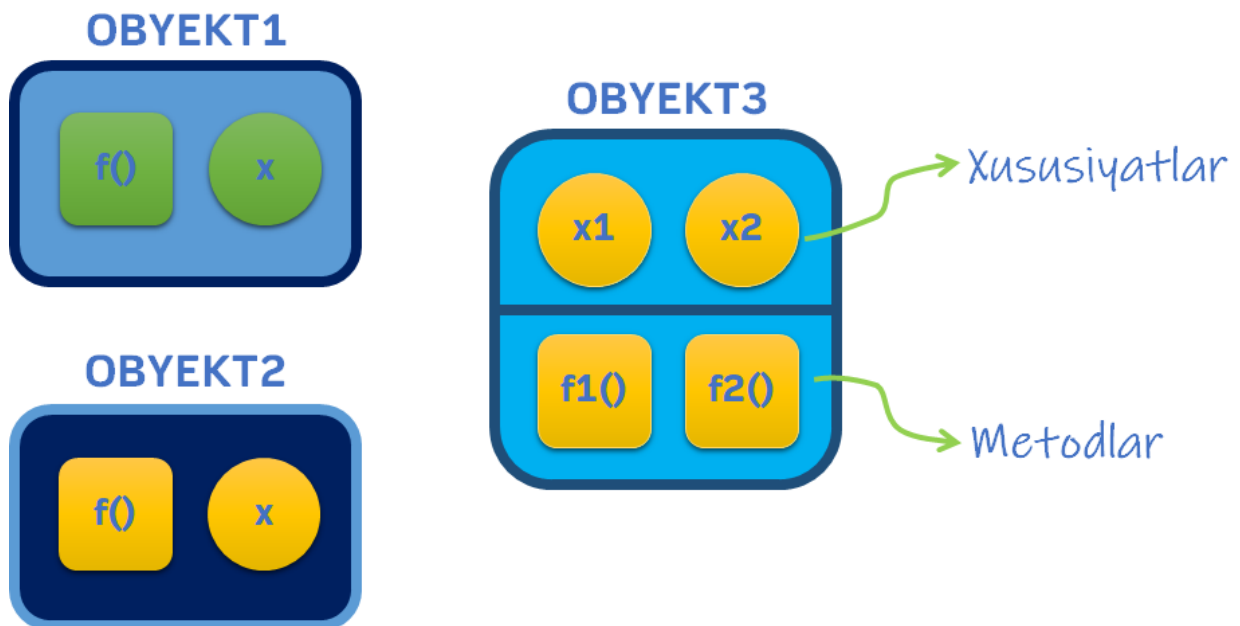
Let's take an example of an object called a car. The model, color and price of the car are its characteristics. Actions such as start(), stop() and acceleration() related to the car are called its methods.

SUCCESSION

In the process of programming, we can create other classes from one class. For example, we have a transport class, from this class we can create additional classes such as Car, Bus, Ship, Train. In this case, our original class is called the parent or super class, and the classes created from it are called successor classes.
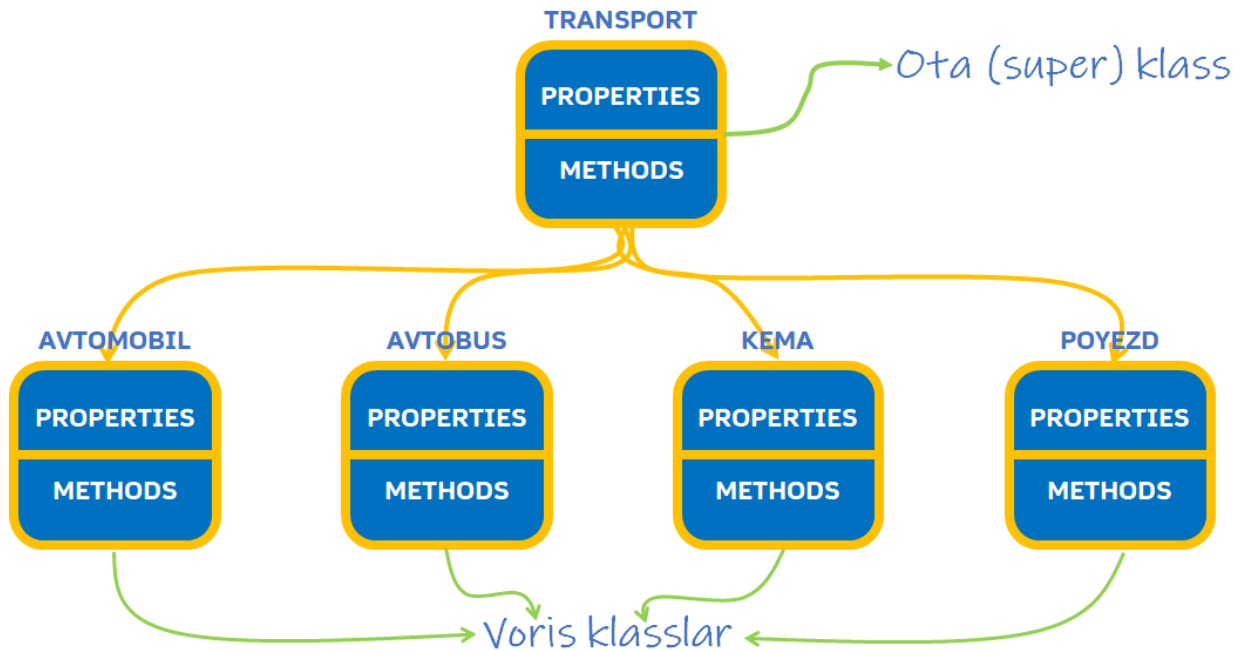
Derived classes inherit some or all of the properties and methods of the parent class.

POLYMORPHISM

Polymorphism is when a successor class keeps the name of a method inherited from the superclass and changes its operation.

ADVANTAGES AND DISADVANTAGES OF OOP

At the end of our lesson, let's talk about the advantages and disadvantages of OOP.

Advantages

- ✓ Parallel programming – different parts of the same project can be created at the same time
- ✓ The principle of inheritance allows classes to be reused
- ✓ The principle of polymorphism makes classes flexible
- ✓ Classes can be reused in other programs and project

Disadvantages

- ✓ A bit confusing for those new to programming
- ✓ Not always effective
- ✓ Sometimes it can make our program too complicated

What is OOP itself?

OOP is a programming method related to the concept of Class.

OOP was designed to focus on the object during programming rather than on the program procedure. An object can be anything we see around us.

This is a person (m.u - name, address, DOB, etc.), a chair (size, material, value, etc.), a school (location, student knowledge, results), etc.

Object-oriented programming is close to real life, because we always work with an object, perform operations on it using methods and variables.

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OOP concepts
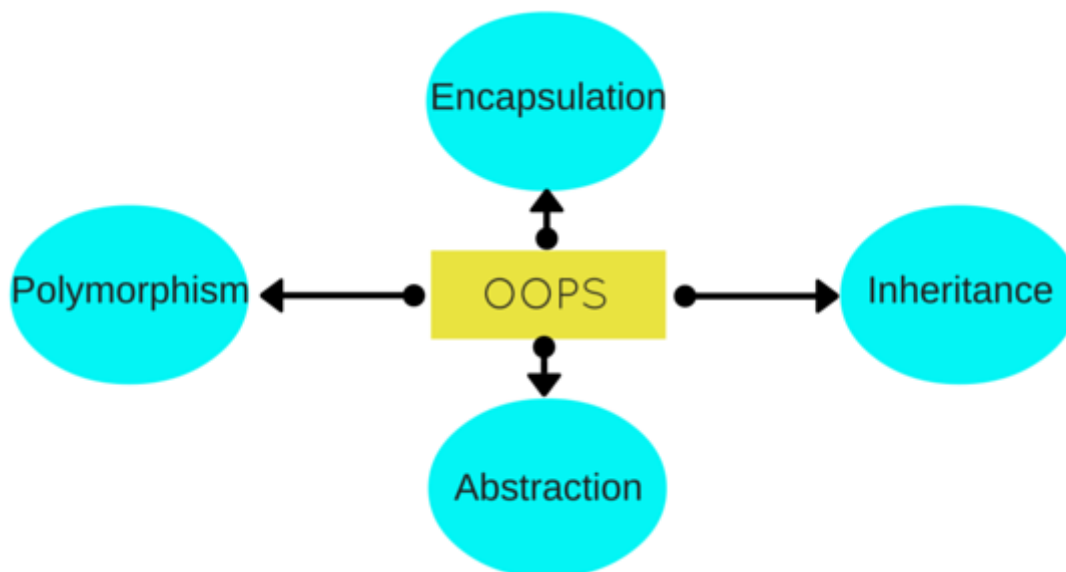
oops

Encapsulation, Polymorphism, Abstraction, inheritance.

Allow me to clarify the confusing terms above.

I will try to explain this with a simple example. Humans are divided into 2 types based on their lifestyle and gender: Male and Female, right? Yes, that's right. Each person (man, woman) has 2 legs, arms, 2 eyes and 1 nose and heart, etc. These are common body parts for men and women. However, there are body parts that a man does not have in a woman, and a woman does not have in a man.

All mankind eats, drinks, sees, etc. Again, both men and women have common functions that are not shared by each other. For example: A woman can give birth to a child, but a man cannot, and this is only the case for women.

Human anatomy is interesting, isn't it? But let's see how it relates to PHP and OOP.

Research results:

Class

Here we take human as a class. A class is a template for expressing the properties and functionality of any functional component. Like a person, his body parts and different activities (functions).

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Inheritance

Imagine we have a class named Human with properties like legs, arms, eyes, and functions like walking and seeing. We have both Male and Female classes, but more properties and functions are covered in the Human class. Therefore, they inherit everything from the Human class using the concept of Inheritance.

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Objects

My name is Sanjar. I am an instance/object of class Male. When we say person, man and woman, we mean you, friend, I and other forms of classes. We have a physical existence, whereas the definition given to a class is just a logical definition. We are objects.

P.S: An individual instance of a data structure defined by a class. You define a class once and can create many objects belonging to it.

Abstraction

Abstraction is the selection of information from a large space and rendering it to an object. It helps in improving programming excellence and performance.

Encapsulation

Placing (closing) some information in one part is called encapsulation. Encapsulation is used to protect information in an object from another. You understand that encapsulation is mainly used for protection purposes.

Polymorphism

Polymorphism represents a pattern in object-oriented programming where classes have different functionalities while sharing a common interface.

Polymorphism is derived from the Greek word meaning "many forms".

In other words, polymorphism is adding a set of classes with the same interface. Polymorphism is a key part of php oop.

CONCLUSION

Of course, our knowledge and experience of the concept of OOP will help us when we learn other programs and programming environments, and when we work on various projects. The advantages of OOP are - Parallel programs - different parts of the same project can be created simultaneously by different programmers, Inheritance principle allows classes to be reused, Polymorphism principle makes classes flexible

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