

# Object Oriented Programming Real World Examples

**1) Encapsulation:** Here is where the encapsulation comes into play, it's giving you the ability of doing an action without the fear that some other entity might modify your data state in a inconsistent way. (because if you wish to modify the state of the data you must do so through methods you defined in the object).

- **Example 1 :** the pencil box which you use daily, that pencil box contains other things also like eraser, sharpner etc. Same in the case of programming,.the OOPS gives us the advantage of gathering the data and functions in the same box which is called "Class".
- **Example 2 :** The way you walk, the way you eat, everything is a part of you and a part of your body functions..
- **Example 3 :** automatic cola vending machine is a class. It contains both data i.e. Cola can and operations i.e. service mechanism and they are wrapped/integrated under a single unit Cola Vending Machine. This is called Encapsulation.

**2) Abstraction :** The act of representing essential features without including background details.

- **Example 1 :** A computer has a high level of abstraction. We perform several tasks via computer whether they are calculations, I/O Operations, file sharing, listening music.
- **Example 2 :** As a smartphone user , we are nor aware of internal complexity of smartphone like internal circuits etc. , we a user we only use touchscreen and some buttons.
- **Example 3 :** Car can be understood as an abstract concept by you, you don't have to understand the actual technical implementation of it.

- **Example 4 :** I use the pen to write, but I really have no idea, about how the ink manages to reach the nib. And how it comes from the nib of the pen to the paper. What happens inside the pen is something I have no idea about, all I know is that I can use it to write.

**3) Inheritance :** the derived class takes some characteristics from the base class. The inheritance is beneficial for programming because with the help of this we can make our code as short as possible and there will be not any kind of redundancy.

- **Example 1 :** There are different kinds of pens- fountain, ball point, sketch pen. Now while a pen has certain common properties like say amount of ink, material used, type of nib used, the different pens have their own properties. So for a sketch pen, the kind of colors it uses, for a ball point, the type of ball used, for a fountain pen, the quality of nib.
- **Example 2 :** Another example in biology is the diabetes disease. Its very well known in India that if one of your parents have diabetes, chances are that you might have diabetes too some time later in your life. Similarly, if both of your parents have it, then that chance doubles, if either of their parents (your grand-parents) have it, that chance triples and so on. Ask any doctor and he will confirm this!
- **Example 3 :** Consider a mobile phone Redmi Note 5 which is loaded with several features. Now after sometimes, another version Redmi Note 5 Pro came in the market that has more advanced features compare to the former one. This is inheritance.
- **Example 4 :** Consider clothes having different properties like fabric, brand, price. Now there are also several categories in clothing like jeans, shirts, t-shirts, frocks, saaree, kurtis, etc.

**4) Polymorphism :** It is a way through which an object can exist/depicts more than one form based on the situation. It provides dynamic nature to an object's behaviour.

**Example 1 :** Us humans can depict different behaviours based on the situation/environment. We behave formally and abide business etiquettes in an industrial environment. While show informal and friendly communication with friends and family.

**Example 2 :** Typically the pen has a method Write() which implements the writing part. However this could vary depending on the type of pen used. Writing with a fountain pen is much different from writing with a sketch pen. I could use a sketch pen only for drawing and coloring, which I could not with an ordinary fountain pen. So here you have the pen implementing write in different ways, based on the kind of pen you use.

**Example 3 :** Let's take a simple example, we use milk for drinking..,but milk can also be used to make curd, butter etc.

**Example 4 :** For instance, steering wheel is an interface that almost all drivers are aware of, but they don't have to worry whether the underlying accessory (class in OOP lingo) is a BMW, Mercedes or a Ford. This process of creating a common interface to interact with varying implementations is called Polymorphism.

## **5) Static variables and Static methods**

**Example 1 :** Air Flight Ticket counter

**Example 2 :** ATM where get currency denominator can be a static method which return fixed denominator every time

**Example 3 :** Banking application can have getInterest rate as static method which return a fixed return rate for a period

**Example 4 :** Weather application can have getDate based on timezone as static .