OBJECT ORIENTED PROGRAMMING

Objects have:

- Attributes (show the Features an object)
- Behavior (It means function of the object and shows the nature an object)

1- One object can have some attributes and some behaviors
2- Each object has its own identity and it is completely different with the other objects
3- Objects work together to form a program
4- Two objects maybe would be different based on their attributes but they are same in terms of their gender/material/substance (2 apples one of them is red and the other one is yellow, but both of them are apple)
5- Two objects may have different behaviors. The Boeing 747 is designed for passengers but The F-16 is designed to fight with the enemy.
6- Each object written in an object-oriented programming language has its own properties, has a distinct identity from other objects in the program, and a specific behavior is expected for it.

Class has:

- Attributes (show the Features an object)
- Methods (It means function of the object and shows the nature an object)

1- In object-oriented programming, classes have a unique name that represents their nature
2- In each class, we describe the functions of a class as a Method. In other words, methods are blocks of code that are embedded in the classes, do the job, and ultimately deliver the result to the programmer.
3- Classes are completely raw at first, and they can't do anything until we build an object from them.
4- Objects are meaningless without a Class. The fact of the matter is that in object-oriented programming what is important is understanding the concept of class because without classes there would be no object. In other words, we can create as many objects as we want with using the classes.
5- A class will specify how our object will look like, but note that the class is different with the object.
6- The class is like a building plan. When we want to build a house, we first have to make a plan. The plan includes all the details that determines what the house will look like, but this plan is not the house itself, it is just an abstract map of the actual house that was used to build it.
7- It is true that both objects are made of the same class, but each object has its own properties and functions.
8- A class is a context from which the object is produced.
9- A set of pre-written classes in a programming language is called a library.
10- An abstraction class with its own attributes and methods creates many objects with different attributes and behaviors.

There are four basic principles to building classes in object-oriented programming:

1- Abstraction (An abstraction class with its own attributes and methods creates many objects with different attributes and behaviors.)
2- Encapsulation (In programming, encapsulation refers to the time we put the attributes and behaviors of an object in a hypothetical encapsulation and put them together. In addition, by applying a concept called Encapsulation, we will be able to restrict access to the part or portions of a class or object under which the class is written. Restricting access to some class capabilities - will instantly apply to all objects created by this class.)

* Meanings such as "Abstraction" and "Encapsulation", together, are creating that space for us as programmers to create many abstract concepts/classes to build as many specific objects as we want based on any level of access or restriction to those classes, in the future.

3- Polymorphism (When we want to use something from another class, we simply inherit it, but if we want to change that inheritance, we override Attribute or Behavior.)
4- Inheritance (In the simplest meaning, Inheritance can be translated to "reuse pre-written code")
5- Association.
6- Aggregation.
7- Composition