## Object-Oriented Programming Concepts

**Object-Oriented Programming**

It is a programming methodology that defines objects whose behaviors and interactions accomplish a given task.

**Object**

- An object has characteristics or **attributes**.
- The values of an object's attributes give the object a **state**.
- The actions that an object can take are called **behaviors**. Each behavior is defined by a piece of Java code called a **method**.

**Class**

- Objects of the same kind are said to have the same data type and belong to the same class.
- A **class** defines a kind of object; it is a blueprint for defining the objects.
- The data type of an object is the name of its class.

**Inheritance**

- One way of organizing classes is through inheritance.
- Inheritance allows objects of a class to take on the properties of objects from another class.
- Inheritance is used to avoid the repetition of programming instructions for each class.
- To apply inheritance between classes, the ***extends*** keyword is used.

**Interface**

- An **interface** is a program component that contains the heading for a number of public methods.
- Some interfaces describe all the public methods in a class while others specify only certain methods.
- An interface is used by another class through the ***implements*** keyword.

**Package**

- A **package** is a collection of related classes and interfaces that have been grouped together into a folder.
- The name of the folder is the name of the package.
- The classes in the package are each placed in a separated file and the file name begins with the name of the class.
- You can use all the classes that are in a package within any program or class definition by placing an **import** statement.
- The class does not need to be in the same folder with the classes in the package. The syntax is:

```
import package_name.class_name_or_asterisk;
```

  Examples are:

```
import java.util.Scanner;
import java.util.*;
```

**References:**

Baesens, B., Backiel, A. & Broucke, S. (2015). *Beginning java programming: The object-oriented approach*. Indiana: John Wiley & Sons, Inc.

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Savitch, W. (2014). *Java: An introduction to problem solving and programming, 7th Edition*. California: Pearson Education, Inc.