<https://www.geeksforgeeks.org/object-class-in-java/>

|  |  |
| --- | --- |
| Object class in Java | 1. Object class is present in java.lang package. 2. Every class in Java is directly or indirectly derived from the Object class. 3. If a Class does not extend any other class then it is direct child class of Object and if extends other class then it is an indirectly derived. 4. Hence Object class acts as a root of inheritance hierarchy in any Java Program. |
| toString() | toString() provides String representation of an Object and used to convert an object to String.  The default toString() method for class Object returns a string consisting of the name of the class of  which the object is an instance, the at-sign character `@’, and the unsigned hexadecimal representation of the hash code of the object.    It is always recommended to override toString() method to get our own String representation of Object. |
| hashCode() | 1. For every object, JVM generates a unique number which is hashcode. It returns distinct integers for distinct objects. 2. A common misconception about this method is that hashCode() method returns the address of object, which is not correct. It convert the internal address of object to an integer by using an algorithm. 3. Use of hashCode() method : Returns a hash value that is used to search object in a collection. JVM(Java Virtual Machine) uses hashcode method while saving objects into hashing related data structures like HashSet, HashMap, 4. Hashtable etc. The main advantage of saving objects based on hash code is that searching becomes easy. 5. Note : Override of hashCode() method needs to be done such that for every object we generate a unique number. 6. If two objects have the same hashcode then they are NOT necessarily equal. Otherwise you will have discovered the perfect hash function. 7. But the opposite is true: if the objects are equal, then they must have the same hashcode. |
| equals(Object obj) | 1. equals(Object obj) : Compares the given object to “this” object (the object on which the method is called). 2. It gives a generic way to compare objects for equality. It is recommended to override equals(Object obj) method to get our own equality condition on Objects. For more on override of equals(Object obj) method refer – Overriding equals method in Java 3. Note : It is generally necessary to override the hashCode() method whenever this method is overridden, so as to maintain the general contract for the hashCode method, which states that equal objects must have equal hash codes. |
| getClass() | 1. Returns the class object of “this” object and used to get actual runtime class of the object. 2. It can also be used to get metadata of this class. 3. The returned Class object is the object that is locked by static synchronized methods of the represented class. 4. As it is final so we don’t override it. |
| finalize() | This method is called just before an object is garbage collected.  It is called by the Garbage Collector on an object when garbage collector determines that there are no more references to the object.  We should override finalize() method to dispose system resources, perform clean-up activities and minimize memory leaks.  For example before destroying Servlet objects web container, always called finalize method to perform clean-up activities of the session.  Note :finalize method is called just once on an object even though that object is eligible for garbage collection multiple times. |
| clone() | It returns a new object that is exactly the same as this object. For clone() method refer Clone() |
| wait(), notify() notifyAll() | The remaining three methods wait(), notify() notifyAll() are related to Concurrency. |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |