

How to Create Object in Java with Example

How to create Object in Java | In the previous tutorial, we have known a **class** is a model for creating objects.

Creating an object means allocating memory to store the data of variables temporarily. i.e. we create an object of a class to store data temporarily.

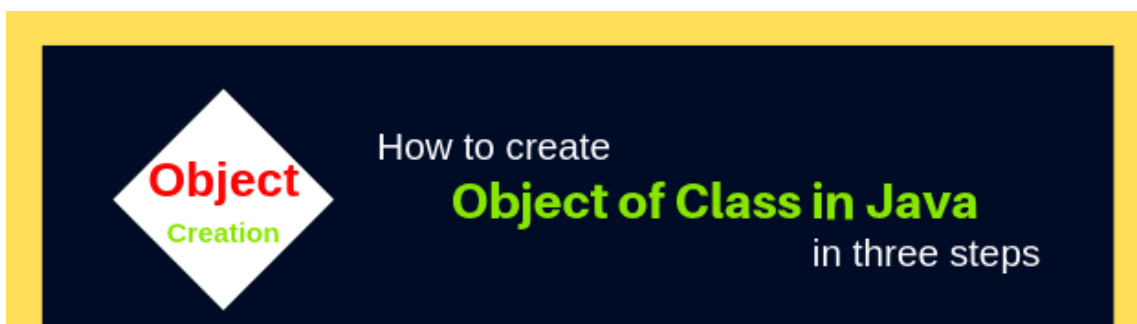
Creating an object is also called instantiating an object. By creating an object, we can access members of any particular class.

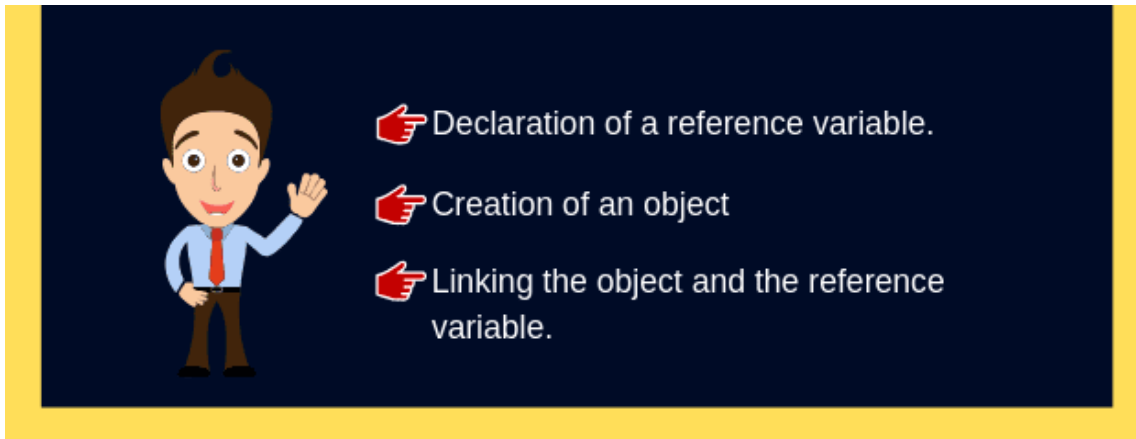
So, let us learn how to create an object of a class in java?

How to create Object in Java?

In Java, an object of a class is created using the new keyword in three steps. They are as follows.

1. Declaration of a reference variable.
2. Creation of an object.
3. Linking the object and the reference variable.





Declaration of Reference variable

Basically, the declaration of an object means refers to an object. A general form of declaration of a reference variable is given below.

```
Classname object_reference_variable; // Creating a reference variable of type Class.
```

The Classname is the name of the class which is being instantiated. The object reference variable is a variable of type Classname.

For example, consider a class whose name is College and object reference variable myCollege. It can be declared like this:

```
College myCollege;
```

This statement tells the JVM to allocate memory space for a reference variable and names that reference variable myCollege. The reference variable is of type College.

Creating Object in Java

We can create an object in a general form like this:

```
new Classname(); // Creating an object of class.
```

The class name followed by parentheses represents the constructor of the class.

For example,

```
new College();
```

This statement tells the JVM to allocate memory space for a new College object on the heap.

Linking Object and Reference

Now, we will link the object and reference created above like this:

```
Classname object_reference_variable = new Classname(); // This is a syntax for  
creating an object of class in java.
```

Assigns the new College to the reference variable myCollege.

```
College myCollege = new College();
```

where,

College → Name of the class.

myCollege → Object reference variable which stores the address of the object in the stack memory.

new → keyword that stores the object in the heap memory.

College() → **Constructor** of the class.

= → The equal sign (=) is an assignment operator. It simply says to take the object created by a new keyword and assign it to the object reference variable.

When an object of class is created, the memory is allocated in the heap area to

store instance variables. After the creation of an object, **JVM** produces a unique reference number (address) for that object. This unique reference number is called **hash code number**.

This reference number is unique for all objects, except string objects. The address of the object is stored in the object reference variable in the stack memory.

We can know the hash code number or reference number (address) of an object by using `hashCode()` method of object class. The following code can be used to know the hash code number.

```
College myCollege = new College();  
System.out.println(myCollege.hashCode()); // It will display hash code stored in  
myCollege.
```

Let's understand the memory allocation for storing an object in Java by given below figure.

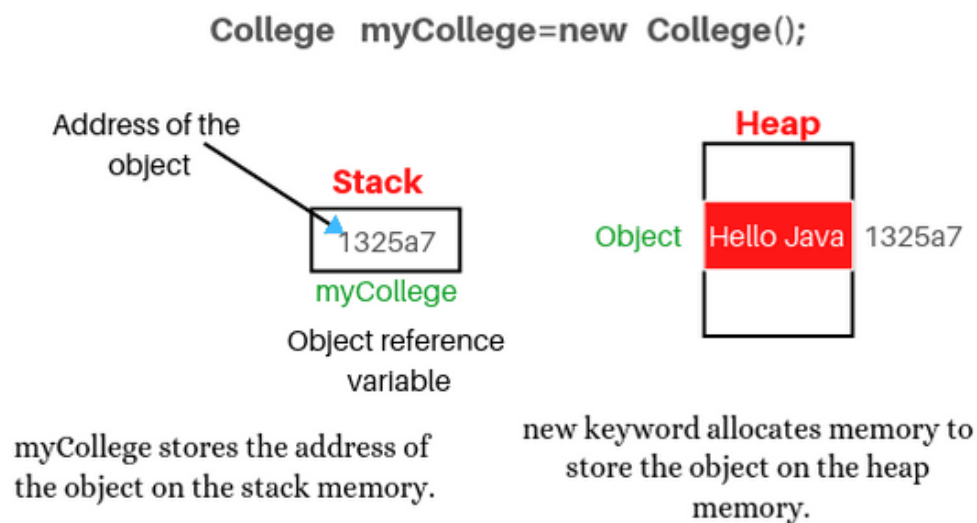


Fig: Memory allocation of storing an object in Java

Explanation:

When the statement `College myCollege = new College();` will be executed by JVM, an object will be created in the heap memory and stores the data "Hello Java" in it.

The address of the object is stored in the reference variable `myCollege` in the stack memory.

Key points:

Remember that creating an object in java means allocating memory for storing data. You can also create an object of the class in two steps like this:

```
Step 1: College myCollege; // Declaration of reference to the object.
```

```
Step 2: myCollege = new College(); // Creating an object.
```

How to create Multiple Objects in Java

Creating multiple objects of one type is as follows:

```
College myCollege1 = new College();
```

```
College myCollege2 = new College();
```

Both reference variables have different memory addresses.

Creating the object with passing different parameters to the constructor.

```
Student st = new Student(); // It will call default constructor.
```

```
School sc = new School("DEEP"); // It will call Parameterized constructor.
```

Object Reference in Java

An object reference is a unique hexadecimal number that represents a memory

address of the object. It is useful to access members of objects.

When a new object is created, a new reference number is allocated to it. It means that every object in Java will have a unique reference.

New Keyword in Java

In Java, a new operator is a special keyword which is used to create an object of the class. It allocates the memory to store an object during runtime and returns a reference to it. This reference is the address of the object in the heap memory allocated by the new operator.

This reference (memory address) is then stored in a variable called object reference variable that can be accessed from anywhere in the application. See below image.

For which purpose we create an object of class in Java?

We create an object in Java applications because of three reasons. They are as follows:

1. Since Java is a purely object-oriented programming language. So Everything is done in the form of objects only. Therefore, objects are required in the Java programming language.

2. To store data temporarily in Java application, we require to create an object.

The object provides temporary storage for our data.

3. In Java, By creating an object, we can call the members of one class from another class. It is useful when we need to use common code in every class again and again.

4. To access members of any particular class, we have to create an object of the respective class

Whenever we create an object in any program, the Object reference variable is automatically generated. By using this object reference variable only, we can access the members of a particular class.

The reference variable must have a reference value. The Dot(.) operator gives you to access an object's state and behavior (instance variables and methods). These are the reasons for which we create objects in Java programs.

How many ways to create object in Java?

There are several ways to create an object of class in Java. They are as follows.

1. Using the new keyword
2. Using Class.forName
3. Using Clone.
4. Using Object Deserialization.
5. Using ClassLoader.

In this tutorial, we have discussed object creation using the new keyword. In the further tutorial, we will know about other ways to create an object of class.

Using new keyword is the most basic and common way to create an object of a class in Java. Almost 99% of objects are created using the new keyword.

We can call any constructor using this method whether it is a non-argument or a parameterized constructor.