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Class & Object

WHAT YOU'LL LEARN

- Class
- Object
- Life Cycle of an Object in Java
- Anonymous Object in Java
- Types of Classes in Java

CLASS AND OBJECT

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Class

- In the object-oriented programming language, we design and develop an application program using classes and objects.OOPs Concepts in Java
- The underlying structure of all java programs is made up of classes.
- Anything we want to write in a java program must be encapsulated in a class.
- A class is a model to create objects. It means that we write properties and actions of objects in the class.

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Class Declaration in Java

A class can be declared using the keyword class followed by a class name. It has also a body within braces.

Syntax:

```
modifierName class className
{
// class body.
}
```

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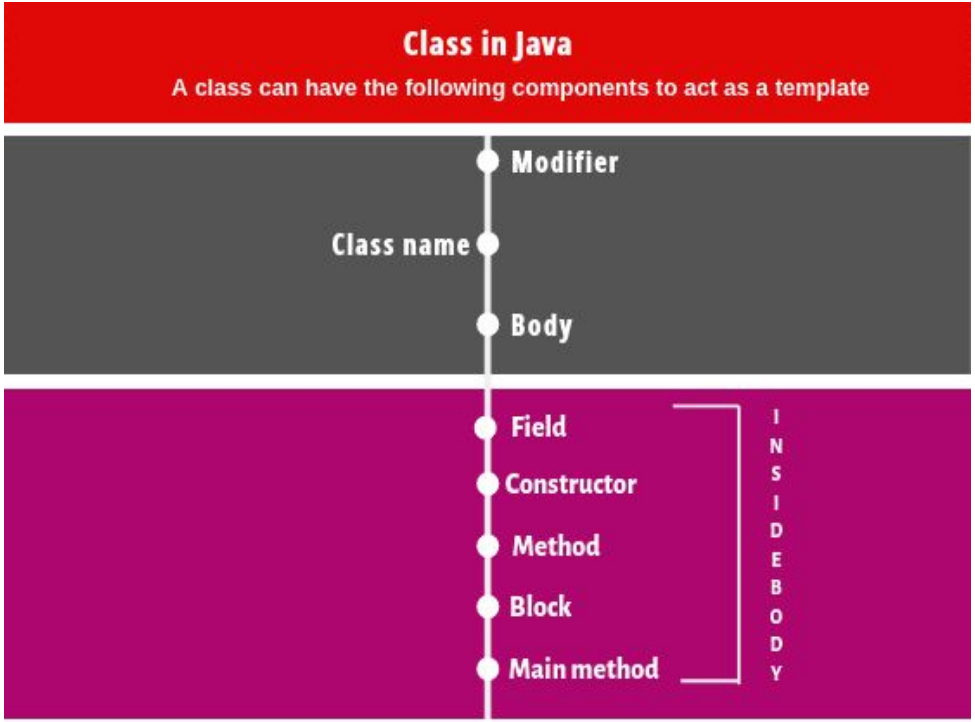
Class Declaration in Java

```
class class_name
{
 // Class body starts here.
 // Members of a class.
      1. Field declarations;
      2. Constructor declarations;
      3. Method declarations;
      4. Instance block declarations;
      5. Static block declarations;
 } Ends here
```



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Main method in JAVA

A class has also the main method that provides the entry point to start the execution of program.

```
public static void main(String[] args)
{
 //  This is a static region.
      .............
}
```

CLASS AND OBJECT

Object

- An object is a basic unit of an object-oriented programming language. It is any real-world thing that has properties and actions.
- In other words, an entity that has state and behavior is known as object in Java.
- An object is an instance of a class. Each instance of an object holds its own relevant data.

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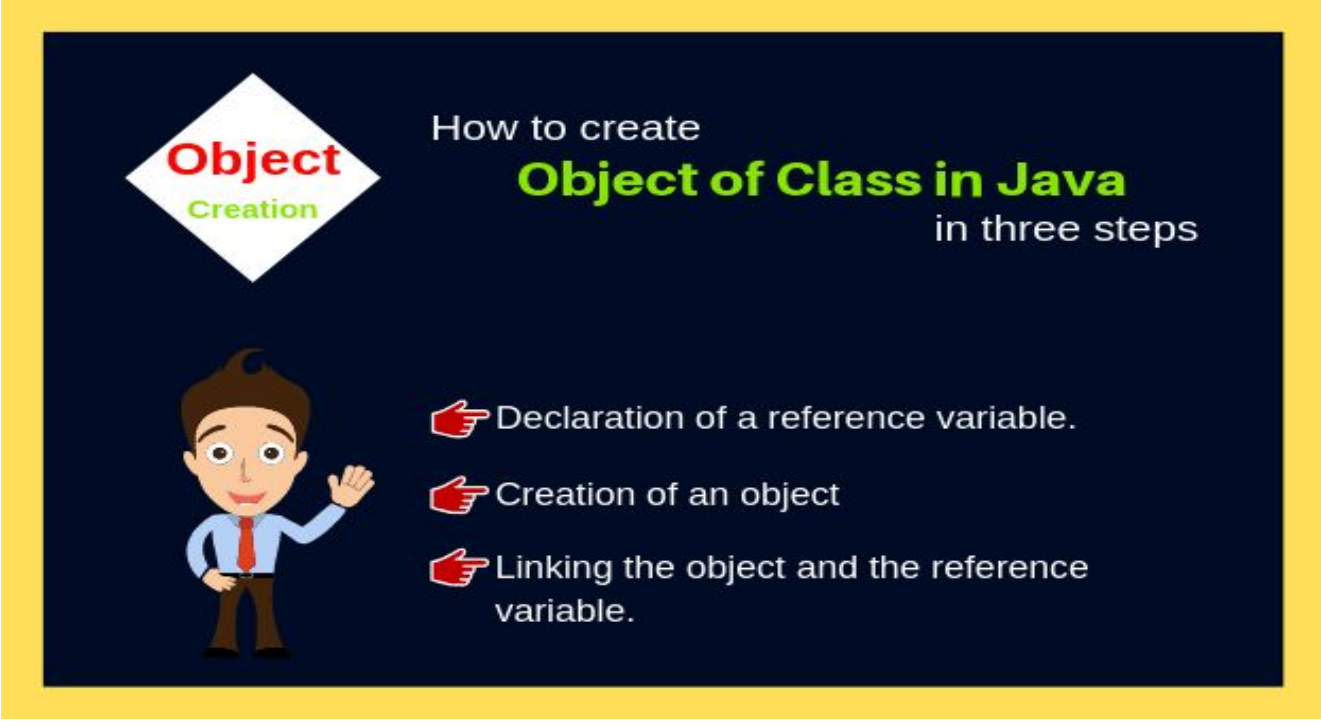
Object



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Object

Declaration of Reference variable

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

Creating Object in Java

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

Linking Object and Reference variable

```
Classname object_reference_variable = new Classname();
```

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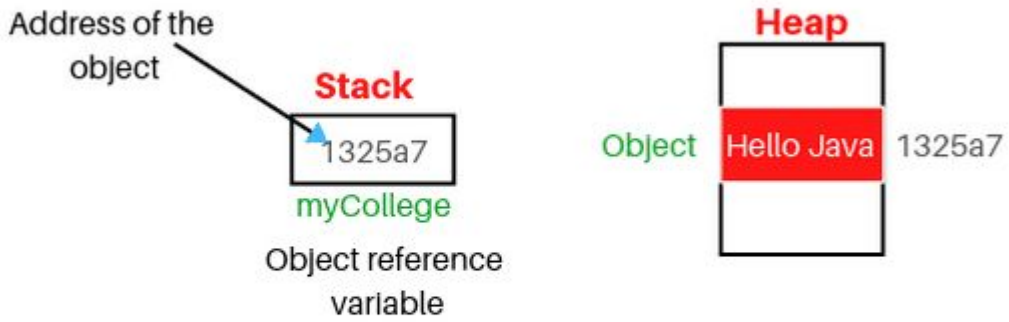
Object

Memory Allocation of storing an object in Java

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



myCollege stores the address of the object on the stack memory.

new keyword allocates memory to store the object on the heap memory.

Fig: Memory allocation of storing an object in Java

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Life cycle of an Object in Java

Life cycle of an object in Java

There are seven steps comes in the life cycle of object in java.

Step 1: Creation of .class file on disk

Step 2: Loading .class file into memory

Step 3: Looking for initialized static members of class

Step 4: Ways to initialize class in java

Step 5: Allocation of memory for object and reference variable

Step 6: Calling of the constructor of class

Step 7: Removing of object and reference variable from memory

Anonymous Object in Java

An object which has no reference variable is called anonymous object in Java.

Syntax:

```
new Class_name();
```

CLASS AND OBJECT

Anonymous Object in Java

```
package anonymousObject;
 public class Calculation
{
    int a;
    Calculation(int p)
    {
     a = p;
    }
   void area()
   {
     int area = a * a;
     System.out.println("Area of square: " +area);
   }
void perimeter(int b) {
int peri = 4 * b;
   System.out.println("Perimeter of square: " +peri);
 }
public static void main(String[] args)
 {
// Create anonymous object.
     new Calculation(50).area();
     new Calculation(10).perimeter(100);
     new Calculation(20).area();
     new Calculation(30).perimeter(200);
  } }
```

CLASS AND OBJECT

Types of class in Java

- Concrete Class
- Static Class
- Abstract Class
- Final Class
- Inner Class
- Public Class
- Private Class
- Singleton Class

CLASS AND OBJECT

Concrete Class

```
public class Concrete { // Concrete class
int a;
int b;
Concrete() {
 a = 50;
 b = 50;
}
void display() {
 int sum = a + b;
 System.out.println("Sum of two numbers: " +sum );}
public static void main(String[] args) {
Concrete c = new Concrete();
 c.display();}}
```

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Static Class

```
public class A
{
 static class B  {
  public void m1()
  {
     System.out.println("Static nested class method");
  }
 } public static void main(String[] args)
{
    B b = new B();
    b.m1();
   }
}
```

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Abstract Class

```
public abstract class Hello {
 public void msg1() {
    System.out.println("msg1-Hello");
  }
abstract public void msg2();
}
public class Test extends Hello  {
  public void msg2()  {
   System.out.println("msg2-Test");
  }
public static void main(String[] args) {
  Test obj = new Test();
    obj.msg1();
    obj.msg2(); }}
```

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Final Class

```
final class Hello  {
 public void msg()  {
    System.out.println("msg-Hello");
  } }
public class DerivedClass extends Hello  {
public void msg()
{
 System.out.println("msg-DerivedClass");
 }}
public class Test  {
public static void main(String[] args)  {
 DerivedClass d = new DerivedClass();
  d.msg();}
```

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Predefined Classes in Java

- Object Class
- Math Class
- String Class
- System Class
- Random Class
- Scanner Class
- Wrapper Class

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