

★ What is Java?

- Java is an object-oriented class-based concurrent, Secured and general-purpose Computer-programming language. It is a widely used robust technology.
- Java is a programming language and a platform. Java is a high level, robust, object oriented and secure language.
- Java was developed by SUN MICROSYSTEMS (which is now the subsidiary of Oracle) in the year 1995.
- JAMES GOSLING is known as the father of Java.
- Before Java, its name was OAK. Since OAK was already registered company, so James Gosling and his team changed the name from OAK to Java.
- Currently, Java is used in internet programming, mobile-devices, Games, e-business Solutions, etc. following are given significant points that describe the history of Java.

[1] JAMES GOSLING, MIKE SHERIDAN and PATRICK NAUGHTON initiated the Java language project in June 1991. The small team of Sun engineers called Green team.

[2] Initially it was designed for small, EMBEDDED SYSTEMS in electronic appliances like Set-top boxes.

[3] Firstly, it was called "GREENTALK" by James Gosling, and the file extension was .gt.

[4] After that, it was called OAK and was developed as a part of the green project.

★ Why Java was named as "Oak"?

★ Why OAK?

[5] Oak is a symbol of strength and chosen as its national tree of many countries like the U.S.A, France, Germany, Romania, etc.

[6] In 1995, Oak was renamed as "JAVA" because it was already a trademark by Oak Technologies.

* Why Java programming named "JAVA"?

[7] Why had they chose the name Java for Java language? The team gathered to choose a new name. The suggested words were "dynamic", "revolutionary", "Silk", "Jolt", "JAVA", etc. They wanted something that reflected the essence of the technology: revolutionary, dynamic, lively, cool, unique, and easy to spell, and fun to say.

- According to James Gosling, "Java was the one of the top choices along with Silk". Since Java was so unique most of the team members preferred Java than other names.

[8] Java is an island in Indonesia where the first coffee was produced (called Java coffee). It is a kind of espresso bean. Java name was chosen by James Gosling while having a cup of coffee near by his office.

[9] Notice that Java is just a name, not an acronym.

[10] Initially developed by James Gosling at SUN MICROSYSTEM (which is now a subsidiary of Oracle Corporation) and released in 1995.

[11] In 1995, Time magazine called JAVA ONE OF THE TEN BEST PRODUCTS OF 1995.

[12] JDK 1.0 was released on Jan. 23, 1996. After the first release of Java, there have been many additional features added to the language. Now Java is being used in Windows applications, Web applications, enterprise applications, mobile applications, cards, etc. Each new version adds new features in Java.

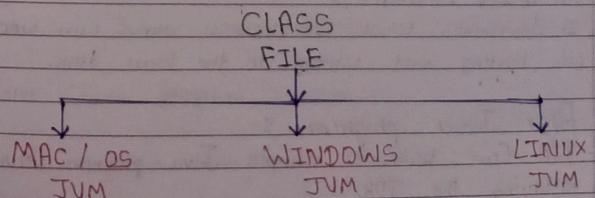
* Java is platform independent because it is different from other languages like C, C++, etc. which are compiled into platform specific machines while Java is a write once, run anywhere language.

* A platform is the hardware or software environment in which a program runs.

* There are two types of platforms:
1. Software-based
2. Hardware-based.

- Java provides a Software-based platform.

* The Java platform differs from most other platforms in the sense that it is a Software-based platform that runs on top of other hardware-based platforms. It has two components:
• Runtime environment
• API (Application programming interface)



* Java Code can be executed on multiple platforms, for example, Windows, Linux, Sun Solaris, Mac OS, etc. Java code is compiled by the Compiler and converted into bytecode. This bytecode is a platform-independent code because it can be run on multiple platforms, i.e., WRITE ONCE AND RUN ANYWHERE (WORA)

* SECURED :-

- Java is best known for its security. With Java, we can develop virus-free systems. Java is secured because:
 - No explicit pointer
 - Java programs run inside a virtual machine Sandbox.

* CLASSLOADER :-

- Classloader in Java is a part of the Java runtime environment (JRE) which is used to load Java classes into the Java virtual machine dynamically. It adds security by separating the package for the classes of the local file system from those that are imported from network source.

* BYTCODE VERIFIER :-

- It checks the code fragments for illegal code that can violate access rights to objects.

* SECURITY MANAGER :-

- It determines what resources a class can access such as reading and writing to the local disk.

* First Java program :-

- We can write a simple Java program easily after installing the JDK.
- File Name :- Simple.java

Class Simple

```
public static void main (String args [] )  
{  
    System.out.print ("Hello World");  
}
```

* Compile & Run Java program :-

* Remember the below points :-

- Java program written in Notepad, Notepad++, Sublime, Eclipse, Netbeans, etc.
- Before writing any Java programs first make a folder of each Java program and save it. (Because when you compile any Java program it will create two separate files 1. Class & 2. Java So.)
- Java starts the compilation of program from main-class. So keep the same name of both 1. Main class name & 2. Saved file name. (Means give the same name of main class as well as file name that you will save.)

* Compile the Java program System :-

javac main-class-name.java

Ex... Java Simple.java

* Run Java program System :-

java main-class-name

Ex... Java Simple

[8] Constructors in Java :-

In Java, a constructor is a block of codes similar to the method. It is called when an instance of the class is created. At the time of calling constructor, memory for the object is allocated in the memory. It is a special type of method which is used to initialize the object.

Every time an object is created using the new() keyword, at least one constructor is called.

- It calls a default constructor if there is no constructor available in the class. In such case, Java compiler provides a default constructor by default.

* Types of Java Constructor :-

- There are two types of Java Constructor :-

1. Default Constructor (no-arg constructor)
2. Parameterized Constructor.

// Default & Parameterized Constructor // Dynamic

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

```
class Prog // CLASS
```

```
{
```

```
    Prog() // default constructor
```

```
{
```

```
    System.out.println("Hello");
```

```
}
```

```
    Prog(int no1, int no2) // parameterized constructor
```

```
{
```

```
        int Sub = no2 - no1;
```

```
        System.out.println("the Subtraction is :" + Sub);
```

```
}
```

Difference between Constructor & method in Java :-

- There are many differences between Constructors and methods. They are given below.

Java Constructor vs Java method

- A Constructor is used to initialize the behavior of an object.
- A method is used to expose the state of an object.
- A Constructor must not have a return type.
- A method must have a return type.
- The Constructor is invoked implicitly.
- The method is invoked explicitly.
- The Java Compiler provides a default Constructor if you don't have any Constructor in class.
- The Constructor name must be same as the class name.
- The method name may or may not be same as the class name.

This Keyword :-

The `this` keyword refers to the current object in a method or constructor.

The most common use of the `this` keyword is to eliminate the confusion between class attributes and parameters with the same name because a class attribute is shadowed by a method or constructor parameter. If you omit the keyword in the example above, the output would be "0" instead of "5".

This can also be used to :-

- invoke current class constructor
- invoke current class method.
- return the class object
- Pass an argument in the method call
- Pass an argument in the constructor call.

[II] This Keyword Static program...

Class info

```
class info
```

```
{ int id;
  String name;
  double fees; }
```

info() // Constructor

{

System.out.print("Hello world");

}

void print() // Function

{

System.out.print("Hello");

}

info(int id, String name, double fees)

{

this.id = id;

this.name = name;

this.fees = fees;

}

→ //Without this keyword

/* info(int i, String n, double f)

{

id = i;

name = n;

fees = f;

*

→ //With this keyword