Java has taken the software world due to its close ties with the Internet and Web browsers. It is mainly intended for development of object oriented network based software for internet applications. It is designed as a portable language that can run on any web-enabled computer via the computer’s web browser. Java development tools are rapidly developed and are available from major software companies as IBM and Microsoft.

Java is the object-oriented programming language developed by SUN (Standford University Network) MICROSYSTEMS USA in 1995. It is a combination of features of C and C++ with some essential additional features. It has obtained its format from C, and OOP features from C++. Java is well suited for both standalone and web application development and is designed to provide solutions to most of the problems faced by users of the internet era.

Java programs are platform independent which means they can be run on any operating system with any processor as long as the Java Interpreter is available on that system. Java is defined as “new simple object oriented programming”.

**CREATION AND HISTORY**

In 1990 Sun Microsystems has conceived a project to develop software for consumer electronic devices that could be controlled by remote. This project was called Stealth Project but later its name was changed to Green Project.

In January 1991, James Gosling, Mike Sheradin, Patrick Naughton met to discuss this project. For the system to work, it needed to be built with a language that could be used on various pieces of hardwares i.e. a system independent language was required. So James Gosling developed a system independent language called Oak. It was later renamed to Java as Oak was already registered to some company.

Eventually, it was decided to sideline the hardware development and promote the language itself as tool for providing multimedia. By 1994, They developed WebRunner- a Java based web browser, which was later renamed as HotJava. It was the first browser, having the capability of running applets, which are programs designed to run dynamiccaly on the Internet. Sun formally announced Java and HotJava at SunWorld conference in 1995.

Since those early days Java has matured into an industrial strength language, with different editions for desktop, server and portable/embedded device development, and ahuge number of application programming interfaces(APIs) for different kinds of application. It has become one of the key technology of global software development. Since Oracle’s takeover of Sun Microsystem in 2010, Java has become Oracle technology, but it is still free to use and is available as an open source project.

History of Java programming language is usually associated with origin predates of the web. James Gosling, Patrick Naughton, Chris Warth, Mike Sheridan, and Ed Frank initiated the Java language project in June 1991. The idea was to develop a language which was platform-independent and which could create embedded software for consumer electronic devices. It took 18 months to develop and had an initial name as Oak which was renamed to Java in 1995, due to copyright issues.

Features of Java

* **Simple** – Java is easier to code and simple to use. I Java constructs are easy to learn. Java has included many features of C / C ++, which makes it easy to understand. Java does not use pointers, pre-processor header files, goto statement, operator overloading, multiple inheritance etc. Java is simplified version of C++.
* **Platform independent** – Platform independent means ability of the program to run on different platforms without modifications. C and C++ are platform dependency languages hence the application programs written in one Operating system cannot run in any other Operating system, but in Java application programs written in one Operating system can able to run on any Operating system.
* **Object-Oriented** - Java supports the features of object-oriented programming. It means that Java focus is on the “data” and the “methods” which operate on the data in an application. The focus is not on the procedure.
* **Robust** – Java is a robust language i.e. the ability to create robust programs was given in a high priority in the design of Java. Since Java is a strictly typed language, it checks the code at compile time and runtime. During the development of the program, it helps us to find possible mistakes as soon as possible.
* **Portable** - Java provides us with the concept of portability. Java compiler generates byte code instruction that can be implemented on any machine. Running the same program with Java on different platforms is possible.
* **Secure** - Java provides a wide range of protection from viruses and malicious programs. Programmers cannot manipulate memory in Java.  It ensures that there will be no damage and no security will be broken. Java achives this protection by confining a Java program to the Java execution environment and not allowing it to access to other parts of the computer.
* **Distributed** - Java is designed for distributed Internet environments as it manages the TCP/IP protocol. Java applications open and access remote objects on the internet easily like they can open and access in local system.
* **Dynamic- J**ava Is a dynamic language designed to adapt to an evolving environment. Java is capable of linking in new class libraries, methods and objects. Java carries a lot of run-time information that is used to verify and resolve accesses to object at runtime.
* **Multi-threaded** – Java programs can do many tasks simultaneously by a process called multithreading. The multithreading programming feature in Java allows you to write a program that performs several different tasks simultaneously. It provides the master solution for synchronizing multiple processes.

**HELLO WORLD PROGRAM**

class HelloWorld

{

    public static void main(String args[])

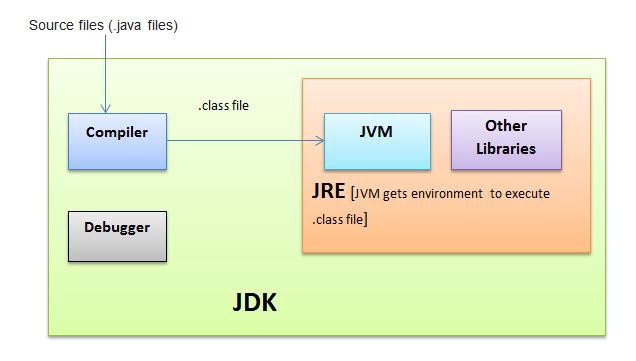
    {

        System.out.println("Hello, World");

    }

}

Java environment



JVM

Java Virtual machine(JVM) is an abstract virtual machine that acts as an interpreter for byte code. Converting Java program(Source code) into byte code helps to run program in different set of environments.

JVM manipulates various memory areas at execution time just like real machines. It is the medium which compiles Java code to bytecode which gets interpreted on a different machine and hence it makes it Platform/Operating system independent.

**JDK**

The Java Development Kit (JDK) is a software development environment used for developing Java applications and applets. It includes the Java Runtime Environment (JRE), an interpreter/loader (java), a compiler (javac), an archiver (jar), a documentation generator (javadoc) and other tools needed in Java development. JDK is required to build and run Java applications and applets.

JRE

The Java Runtime Environment(JRE) is a software layer that runs on top of a computer's operating system, providing additional services specific to Java. . It combines the Java Virtual Machine (JVM), platform core classes and supporting libraries. JRE is part of the Java Development Kit (JDK), but can be downloaded separately. Automatic memory management is one of the JRE's most important services, ensuring that programmers don't have to manually control the allocation and reallocation of memory.

It is the cause of implementation of JVM. It contains a set of supporting libraries in combination with core classes and various other files that are used by JVM at runtime.

### Java Applications

There are many places where Java is used in the real world, from a e-commerce website to android apps, from scientific application to financial applications like electronic trading systems, from games like Minecraft to desktop applications like Eclipse, Netbeans, and IntelliJ, from an open-source library to J2ME apps, etc.

### 1) Android Apps

Apps in your android phone are actually written in Java programming language, with Google's Android API, which is similar to JDK. Android uses different JVM and different packaging, but code is still written in Java.

### 2) Server Apps at the Financial Services Industry

Java is very big in Financial Services. Lots of global Investment banks Barclays, Standard Charted, and other banks use Java for writing front and back office electronic trading systems, writing settlement and confirmation systems, data processing projects, and several others. Java is mostly used to write a server-side application, mostly without any front end, which receives data from one server (upstream), processes it and sends it to other processes (downstream).

### 3) Java Web applications

Java is also big on E-commerce and web application space. You have a lot of services being created using Spring MVC, Struts 2.0, and similar frameworks. Even simple Servlet, JSP, and Struts based web applications are quite popular on various government projects. Many governments, healthcare, insurance, education, defence, and several other departments have their web application built in Java.

**4) Software Tools**

Many useful software and development tools like Eclipse, IntelliJ Idea, and NetBeans IDE are written and developed in. Though there was a time when Swing was very popular to write thick clients, mostly in the financial service sector and Investment banks. Nowadays, Java FX is gaining popularity, but still, it is not a replacement of Swing, and C# has almost replaced Swing in Finance domain.  
  
**5) Embedded Space**

Java is also big in the embedded space. It shows how capable the platform is, you only need 130 KB to be able to use Java technology (on a smart card or sensor). Originally Java was designed for embedded devices. This is the one area, which was part of Java's initial campaign of "write once, run anywhere,".

### 6) Big Data technologies

Hadoop and other big data technologies are also using Java in one way or other e.g., Apache's Java-based HBase and Accumulo (open source) and  ElasticSearch as well. Java is not dominating this space, as there are technologies like MongoDB, which is written in C++. Java has the potential to get a major share of this growing space if Hadoop or ElasticSearch goes big.  
  
**7) Scientific Applications**

Nowadays Java is often a default choice for scientific applications, including natural language processing. Main reason of this is because Java is more safe, portable, maintainable and comes with better high-level concurrency tools than C++ or any other language.

**Types of Java Applications**

There are mainly 4 types of applications that can be created using Java programming:

#### **1)Standalone Application**

#### Standalone applications are also known as desktop applications or window-based applications. An application that we need to install on every machine or server such as media player, antivirus, etc. AWT and Swing are used in java for creating standalone applications.

#### **2) Web Application**

Java is used to create server-side web applications. An application that runs on the server side and creates a dynamic page is called a web application. Currently, [Servlet](https://www.javatpoint.com/servlet-tutorial), [JSP](https://www.javatpoint.com/jsp-tutorial), [Struts](https://www.javatpoint.com/struts-2-tutorial), [Spring](https://www.javatpoint.com/spring-tutorial), [Hibernate](https://www.javatpoint.com/hibernate-tutorial), [JSF](https://www.javatpoint.com/jsf-tutorial), etc. technologies are used for creating web applications in Java.

#### **3) Enterprise Application**

#### An application that is distributed in nature, such as banking applications, etc. is called enterprise application. It has advantages of the high-level security, load balancing, and clustering.

#### **4) Mobile Application**

#### Java is used to create application software for mobile devices. An application which is created for mobile devices is called a mobile application. Currently, Android and Java ME for building applications for small devices, and also Java is a programming language for Google Android application development.

Popular Java Editors

You will need a text editor to write Java programs. These are the popular ones

* Notepad
* Netbeans
* Eclipse

Java is Software industries favourite application development language, and given its heavy usage in financial services industry, Investment banks and E-commerce web application space, any one learning Java has bright future ahead of him.

I hope this article was helpful in getting an overview of Java.