Java program

Java Tutorial

- Java technology is widely used currently. Let's start learning of java from basic questions like what is java, where it is used, what type of applications are created in java and why use java?

What is Java?

- Java is a **programming language** and a **platform**.
- **Platform** Any hardware or software environment in which a program runs, known as a platform. Since Java has its own Runtime Environment (JRE) and API, it is called platform.

Where it is used?

According to Sun, 3 billion devices run java. There are many devices where java is currently used. Some of them are as follows:

1. Desktop Applications such as acrobat reader, media player, antivirus etc.
2. Web Applications such as irctc.co.in, etc.
3. Enterprise Applications such as banking applications.
4. Mobile
5. Embedded System
6. Smart Card
7. Robotics
8. Games etc.

Types of Java Applications

There are mainly 4 type of applications that can be created using java:

1) Standalone Application

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

2) Web Application

An application that runs on the server side and creates dynamic page, is called web application. Currently, servlet, jsp, struts, jsf etc. technologies are used for creating web applications in java.

Types of Java Applications(cont)

3) Enterprise Application

An application that is distributed in nature, such as banking applications etc. It has the advantage of high level security, load balancing and clustering. In java, EJB is used for creating enterprise applications.

4) Mobile Application

An application that is created for mobile devices. Currently Android and Java ME are used for creating mobile applications.

History of Java

James Gosling

Currently, Java is used in internet programming, mobile devices, games, e-business solutions etc. There are given the major points that describes 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) Originally designed for small, embedded systems in electronic appliances like set-top boxes.

3) Firstly, it was called **"Greentalk"** by James Gosling and file extension was .gt.

4) After that, it was called **Oak** and was developed as a part of the Green project.

History of Java

Java history is interesting to know. Java team members (also known as **Green Team**), initiated a revolutionary task to develop a language for digital devices such as set-top boxes, televisions etc.

For the green team members, it was an advance concept at that time. But, it was suited for internet programming. Later, Java technology as incorporated by Netscape.

Why Oak name for java language?

- 5) **Why Oak?** Oak is a symbol of strength and choosen as a national tree of many countries like 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 name for java language?

- 8) Java is an island of Indonesia where first coffee was produced (called java coffee).
- 9) Notice that Java is just a name not an acronym.
- 10) Originally developed by James Gosling at Sun Microsystems (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 released in(January 23, 1996).

Why Java name for java language?

- 7) **Why they choosed java name for java language?** The team gathered to choose a new name. The suggested words were "dynamic", "revolutionary", "Silk", "jolt", "DNA" 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 one of the top choices along with **Silk**". Since java was so unique, most of the team members preferred java.

Java Version History

- There are many java versions that has been released.
- JDK Alpha and Beta (1995)
- JDK 1.0 (23rd Jan, 1996)
- JDK 1.1 (19th Feb, 1997)
- J2SE 1.2 (8th Dec, 1998)
- J2SE 1.3 (8th May, 2000)
- J2SE 1.4 (6th Feb, 2002)
- J2SE 5.0 (30th Sep, 2004)
- Java SE 6 (11th Dec, 2006)
- Java SE 7 (28th July, 2011)

Features of Java

- There is given many features of java. They are also known as java buzzwords.
- Simple
- Object-Oriented
- Platform independent
- Secured
- Robust
- Architecture neutral
- Portable
- Dynamic
- Interpreted
- High Performance
- Multithreaded
- Distributed

Simple

According to Sun, Java language is simple because:

syntax is based on C++ (so easier for programmers to learn it after C++).

removed many confusing and/or rarely-used features e.g., explicit pointers, operator overloading etc.

No need to remove unreferenced objects because there is Automatic Garbage Collection in java.

Object-oriented

Object-oriented means we organize our software as a combination of different types of objects that incorporates both data and behaviour.

Object-oriented programming(OOPs) is a methodology that simplify software development and maintenance by providing some rules.

Basic concepts of OOPs are:

1. Object
2. Class
3. Inheritance
4. Polymorphism
5. Abstraction
6. Encapsulation

Platform Independent

- A platform is the hardware or software environment in which a program runs. There are two types of platforms software-based and hardware-based. Java provides software-based platform. The Java platform differs from most other platforms in the sense that it's a software-based platform that runs on top of other hardware-based platforms.It has two components:

Java code can be run on multiple platforms e.g.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).

1.Runtime Environment
2.API(Application Programming Interface
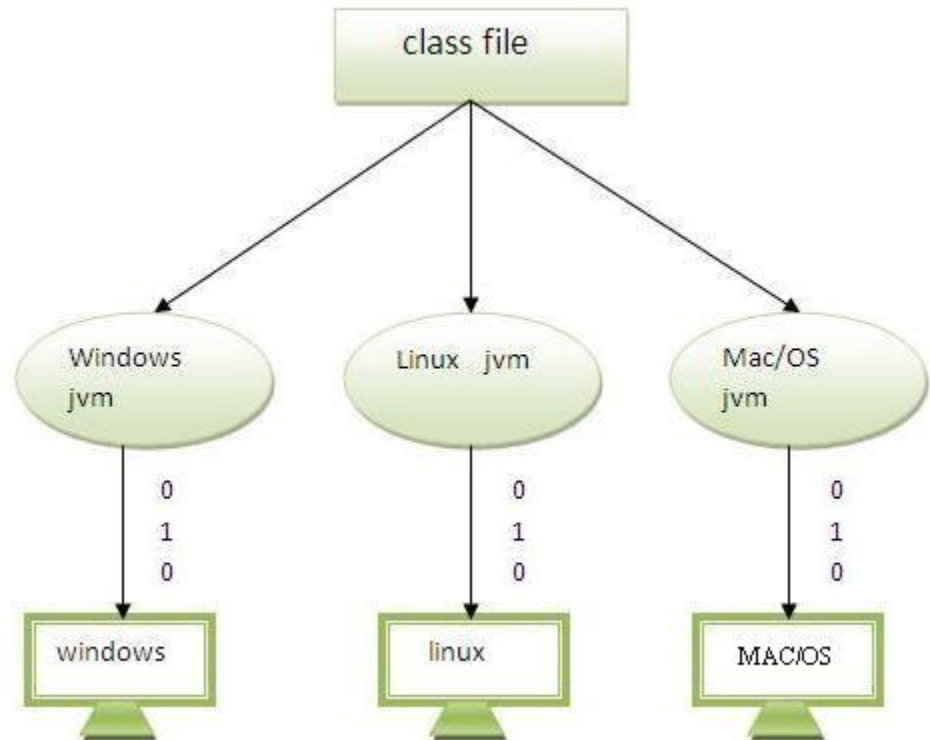
Secured

Java is secured because:

- No explicit pointer
- Programs run inside virtual machine sandbox.

- **Classloader-** adds security by separating the package for the classes of the local file system from those that are imported from network sources.
- **Bytecode Verifier-** checks the code fragments for illegal code that can violate access right to objects.
- **Security Manager-** determines what resources a class can access such as reading and writing to the local disk.

These security are provided by java language. Some security can also be provided by application developer through SSL,JAAS,cryptography etc.

Robust

- Robust simply means strong. Java uses strong memory management. There are lack of pointers that avoids security problem. There is automatic garbage collection in java. There is exception handling and type checking mechanism in java. All these points makes java robust.

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Architecture-neutral

- There is no implementation dependent features e.g. size of primitive types is set.

Portable

- We may carry the java bytecode to any platform.

High-performance

- Java is faster than traditional interpretation since byte code is "close" to native code still somewhat slower than a compiled language (e.g., C++)

Distributed

- We can create distributed applications in java. RMI and EJB are used for creating distributed applications. We may access files by calling the methods from any machine on the internet.

Multi-threaded

- A thread is like a separate program, executing concurrently. We can write Java programs that deal with many tasks at once by defining multiple threads. The main advantage of multi-threading is that it shares the same memory. Threads are important for multi-media, Web applications etc.

Simple Program of Java

- In this page, we will learn how to write the hello java program. We can write a simple hello java program easily.

- To create a simple java program, you need to create a class that contains main method. Let's understand the requirement first.

Requirement for Hello Java Example

- For executing any java program, you need to install the JDK if you don't have installed it, download the JDK and install it.

- set path of the jdk/bin directory. http://www.javatpoint.com/how-to-set-path-in-java

- create the java program

- compile and run the java program

Creating hello java example

- Let's create the hello java program:
- class Simple{
-    public static void main(String args[]){
-     System.out.println("Hello Java");
-    }
- }

- save this file as Simple.java
- **To compile:**javac Simple.java
- **To execute:**java Simple
- **Output:**Hello Java