

UNIT-I

INTRODUCTION TO JAVA

1.1 WHAT IS JAVA? M

Java is an object-oriented programming language, and this is very similar to C++. Java is simplified to eliminate features that cause common programming errors.

Java Technology consists of :

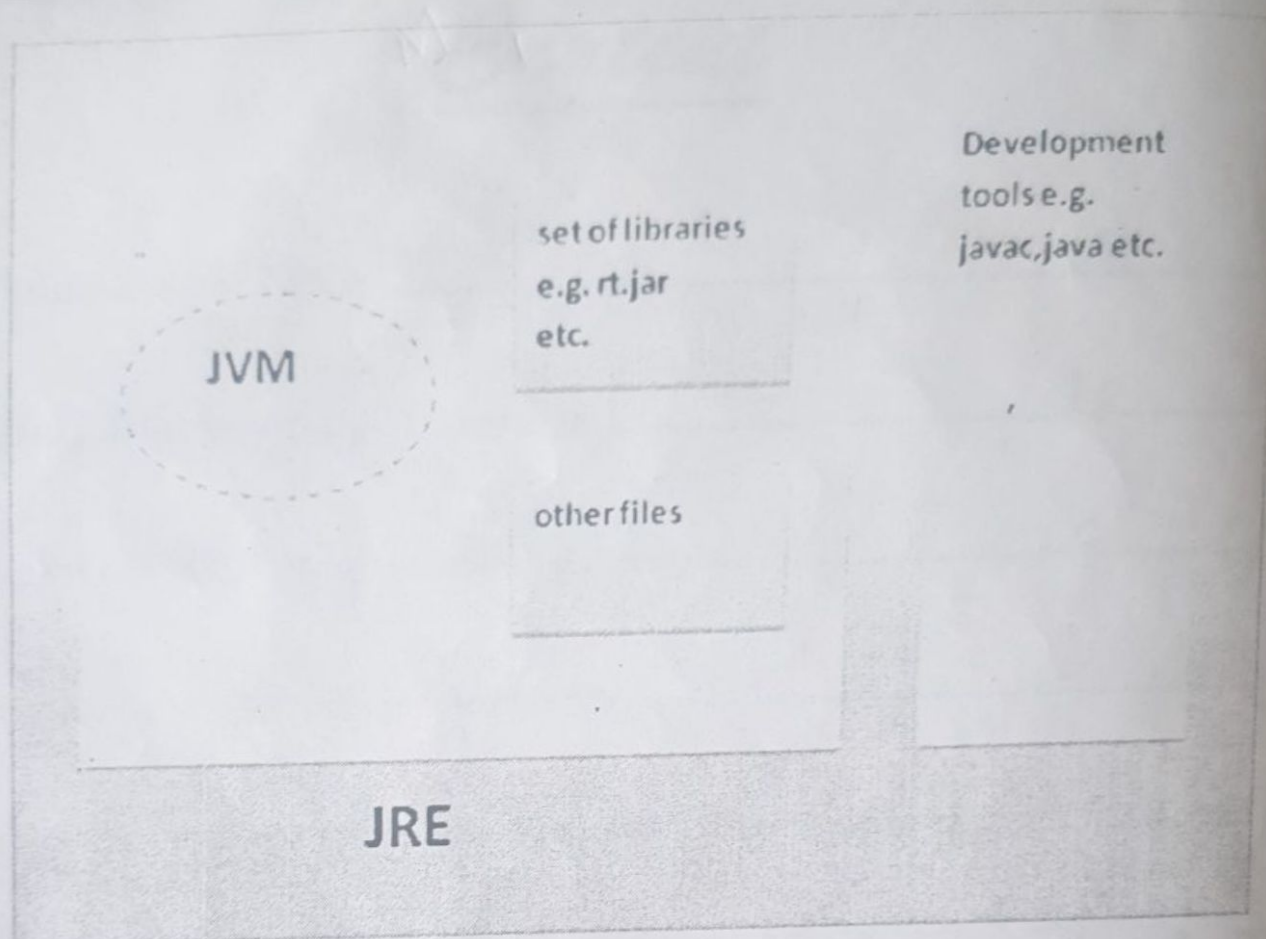
A Programming language

- Java is a programming language, which is derived from C and C++. Java programs can be either Application or Applets.

A Development Environment

Java development kit

- JDK is a software development environment provided by sun Microsystems. It physically exists. It contains JRE + development tools.



JDK

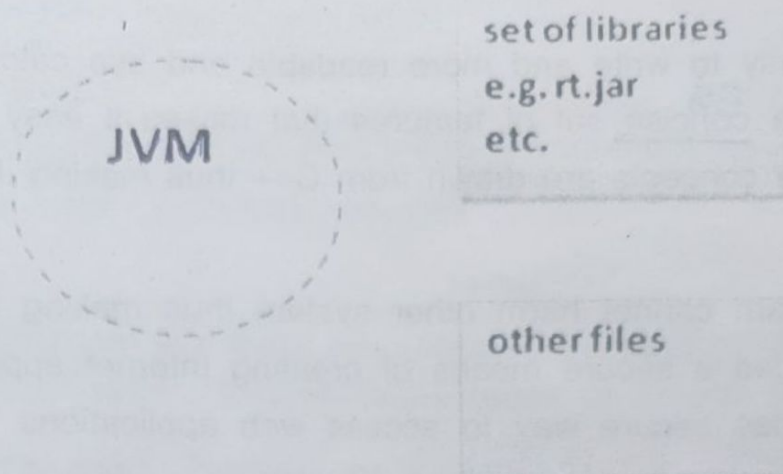
- JDK comes in various versions and can be downloaded free from the Microsystems. JVM compiler, debugger and other tools are used with for developing java based applications & java applets. So make sure your JVM compiler & JDK versions are same.
- JDK also known as Java 2 Platform That comes in three editions J2SE & J2EE.

An Application Environment

- Java Applications are standalone java programs using Java Runtime Environment (JRE), which are executed without use of web browser.
- Java Applets run under the Java enabled web browsers.

A Deployment Environment

- In java there are two "deployment environments" JRE and BROWSERS.
- JRE : JRE is an acronym for Java Runtime Environment, JRE is supplied in Java2 SDK (Software Development Kit). It is the implementation of JVM that physically exists. It contains set of libraries + other files that JVM uses at runtime.



JRE

- JRE contains the complete set of class files for basic language classes, GUI component classes, an advanced Collections API etc for all the java packages. Java interpreter and runtime environment are supplied by java compatible Web Browsers. Applets are executed by java compatible web browsers.

JVMs are available for many hardware and software platforms. JVM, JRE and JDK are platform dependent because configuration of each OS differs. But, Java is platform independent.

2 BACKGROUND/HISTORY OF JAVA

Java was created at Sun Microsystems in 1991. It took 18 months to develop the first working version. This language was initially called "Oak", but it was renamed "Java" in 1995. Oak was first used in television set-top boxes designed to provide video-on-demand services. Oak was unsuccessful so in 1995 Sun changed the name to Java and modified the language to take advantage of the growing World Wide Web.

Actually, their original goal was to create a computer language that could be used to build programs that would run in any different execution environments. They wanted to develop a language that could be used to write software for different consumer electronic devices.

1.2.1 FEATURES OF JAVA M ✓

Simple

- Java is Easy to write and more readable and eye catching.
- Java has a ²³concise set of features that makes it easy to learn and use.
- Most of the concepts are drawn from C++ thus making Java learning simple.

Secure

- Java program cannot harm other system thus making it secure.
- Java provides a secure means of creating Internet applications.
- Java provides secure way to access web applications.

Portable

- Java programs can execute in any environment for which there is a Java time system.(JVM)
- Java programs can be run on any platform (Linux, Window, Mac)
- Java programs can be transferred over world wide web (e.g applets)

Object-oriented

- Java programming is object-oriented programming language.
- Like C++ java provides most of the object oriented features.
- Java is pure OOP. Language. (while C++ is semi object oriented)

Robust

- Java encourages error-free programming by being strictly typed and performing run-time checks.

Multithreaded

- Java provides integrated support for multithreaded programming.

Architecture-neutral

- Java is not tied to a specific machine or operating system architecture.
- Machine Independent i.e Java is independent of hardware.

Interpreted

- Java supports cross-platform code through the use of Java bytecode.
- Bytecode can be interpreted on any platform by JVM.

High performance

- Bytecodes are highly optimized.
- JVM can execute them much faster.

Distributed

- Java was designed with the distributed environment.
- Java can be transmitted, run over internet.

Dynamic

- Java programs carry with them substantial amounts of run-time type information that is used to verify and resolve accesses to objects at run time.

3 THE INTERNET AND JAVA'S PLACE IN IT

The Internet allows many different types of computers to be connected together, including all computers having different CPUs and operating systems. Therefore, the ability to write a portable program is beneficial to the Internet. Java is strongly associated with the Internet because the first application written in Java was HotJava, a Web browser to run applets on Internet.

Java's "write once, run anywhere" philosophy provided this advantage. The inventors of Java examined many different programming languages and adopted their best features.

Internet user can use Java to create applet programs and run them locally using a "Java enabled browser" such as HotJava. They can also use a Java enabled browser to download an applet from a remote computer and run it on his local computer. In fact, Java applets have made the Internet a true extension of the storage system of the local computer. Internet users can also setup their websites containing Java applets that could be used by other remote users of Internet.

Java and WWW

World Wide Web (WWW) is a most useful application of Internet. Before Java, WWW was limited to the display of text and motionless images. However, using Java into web pages has made it capable of supporting animations, graphics, games and wide range of special effects. With the support of Java the Web has become more interactive and dynamic.

On the other hand, with support of web, we can run a Java program on someone else's computer across Internet using applet tag.