

1.3 Java Components

1.3.1 Java Byte Code and Java Virtual Machine

- Compiler translates source code into machine code for specific computer (platform dependent). But the java compiler produce an intermediate code known as **Byte Code**.
- For a machine that does not exist, this machine is called as **‘Java Virtual Machine’(JVM)**.
- **JVM** is an interpreter for **Byte Code**.
- It only exists inside the computer memory. It simulate computer within the computer and perform all major functions of real computer.

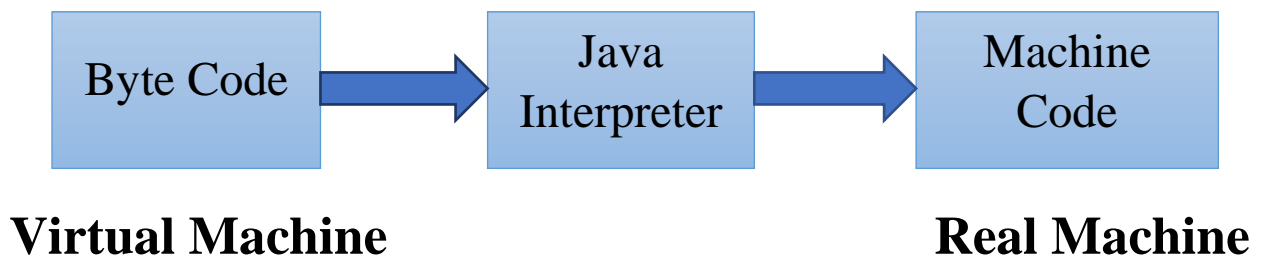


Fig.1.3.1 Process of converting Byte Code into Machine code

- By translating a java program into byte code makes it easier to run the program on a variety of environment thus JVM provides the most convenient way of making portable program.
- When program is compiled and then interpreted, the processing time is reduced because the byte code is highly optimized set of instructions and JVM execute them much faster.

1.3.2 Java Environment

- Java development environment includes a number of development tools, classes and methods. It is a part of system known as **Java Development Kit (JDK)**.
- The classes and methods are part of the **Java Standard Library** known as **JSL**, and it is also known as the **Application Programming Interface (API)**.

□ **Java Development Kit (JDK):** The Java Development Kit is a collection of tools which are used for developing, designing, debugging, executing and running Java Programs.

They include:

- **Appletviewer (for viewing Java applets):**

appletviewer run and debug applets without a web browser, its standalone command-line program to run Java applets.

Syntax: c:\applet viewer<file name of .html file>

- **Javac (Java compiler):**

javac is the compiler for the Java programming language, it's used to compile .java file. It creates a class file which can be run by using java command.

Syntax: c:\javacfilename.java

Example:

c:\javac TestFile.java

- **java (Java interpreter):**

When we compile by using javac, a class file is created, the java command can be used to run the Java program.

Syntax:c:\java filename.class OR c:\java filename

Example:

c:\java TestFile.class OR c:\java TestFile

Both run using the command prompt. .java is the extension for java source files which are simple text files. After coding and saving it, the javac compiler is invoked for creating .class files. As the .class files get created, the Java command can be used to run the java program.

➤ **Javadoc (for creating HTML documents)**

javadoc is an API documentation generator for the Java language, which generates documentation in HTML format from Java source code.

➤ **jar (Java archive)**

The jar is (manage Java archive) a package file format that contains class, text, images and sound files for a Java application or applet gathered into a single compressed file.

➤ **javap (Java disassembler)**

Java disassembler, is used to convert byte code files into programs, description.

➤ **javah (for C header files)**

It is used for producing header files for use with native methods of C and C++.

➤ **jdb (Java debugger)**

Java debugger, which helps us to find errors in our programs