Java

Java is a general-purpose, object-oriented programming language developed by Sun Microsystems of USA in 1991. Originally called Oak by James Goslin, one of the inventors of the language, Java was designed for the development of software for consumer electronic devices like TVs, toasters and such other electronic machines. Java is modeled on C and C++ but removed a number of features of C and C++ that were considered as source of problems and thus made java a really simple, reliable, Portable and powerful language.

Java Features

- Compiled and Interpreted
- Platform-independent and portable
- Object-Oriented
- Robust and Secure
- Distributed
- Familiar, Simple and Small
- Multithreaded and Interactive
- High Performance
- Dynamic and Extensible

Java and C

- Java does not include the C unique statement keywords **sizeof** and **typedef**
- Java does not contain the data types **struct** and **union**
- Java does not define the type modifiers keywords **auto**, **extern**, **register**, **signed** and **unsigned**
- Java does not support an explicit **pointer** type
- Java does not have preprocessor and therefore we cannot use #define, #include and #ifdef statements
- Java adds new operators such as **instanceof** and >>>.
- Java adds labeled **break** and **continue** statements
- Java adds many features required for OOP.

Java and c++

- Java does not support operator overloading

- Java does not have template classes as in C++
- Java does not support multiple inheritance of classes. This is accomplished using a new feature called interface
- Java does not support global variables
- Java does not use pointers
- Java has replaced the destructor function with a finalizer() function
- There are no header files in Java

Java Environment

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

Java Development Kit

Java Development kit comes with a collection of tools that are used for developing and running Java Program. They include:

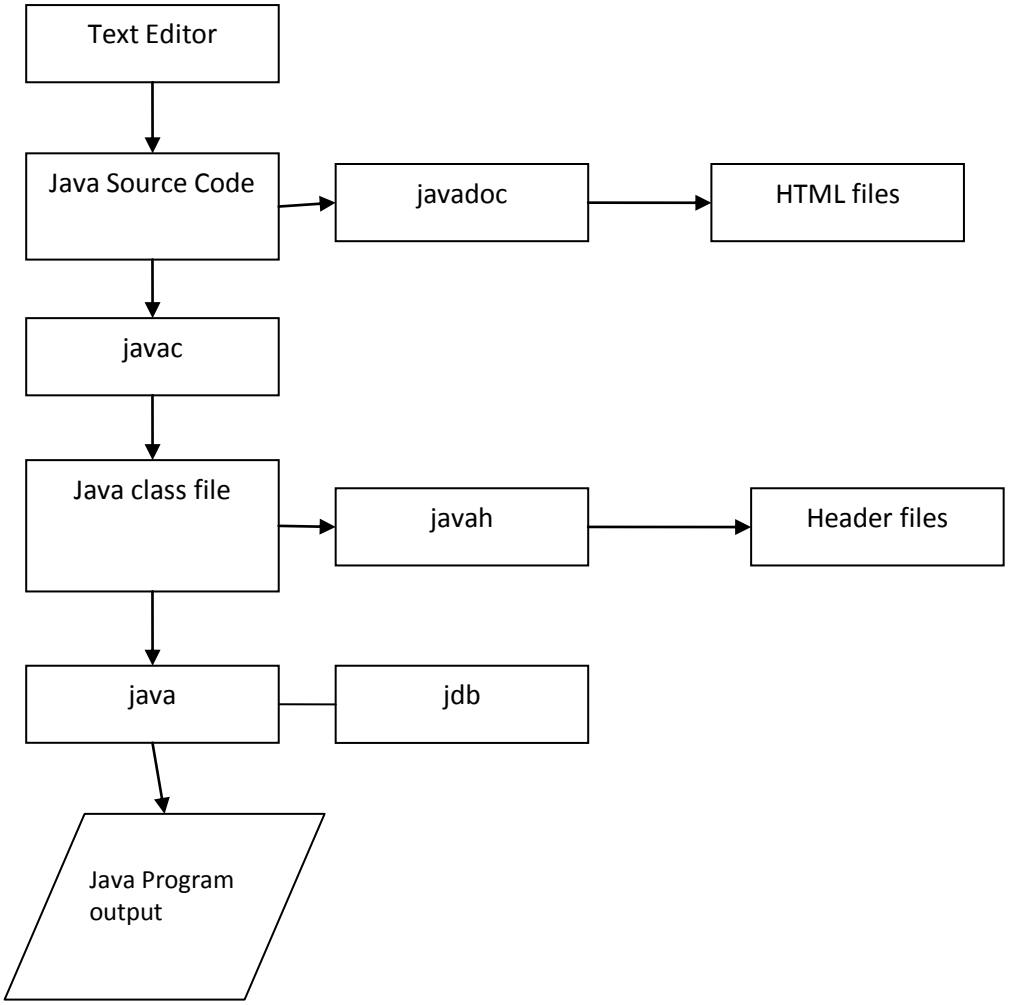
- Appletviewer (for viewing Java applets)
- Javac
- Java
- Javap (java disassembler)
- Javah (for C header files)
- Javadoc (for creating HTML documents)
- Jdb (java debugger)

Application Programming Interface

The Java standard library (or API) includes hundreds of classes and methods grouped into several functional packages. Most commonly used packages are:

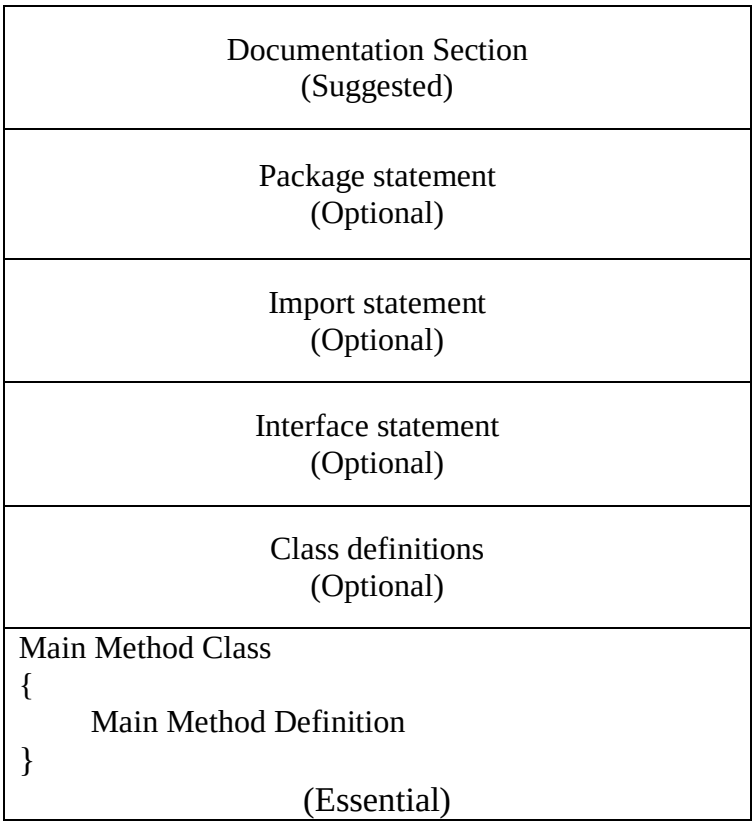
- Language Support package
- Utilities package
- Input/Output package
- Networking package
- AWT package
- Applet package

Process of building and running java application programs



Java program Structure

Java program may contain one or more sections as shown in below figure:



General Structure of a Java program

Documentation Section

The documentation section comprises a set of comment lines giving the name of the program, the author and other details, which the programmer would like to refer to at a later stage.

Package Statement

The first statement allowed in a java file is a **package** statement. This statement declares a package name and informs the compiler that the classes defined here belongs to this package. Ex.

Package students;

Import statement

Import statement is similar to the #include statement in C, Ex:

Import student.test;

This statement instructs the interpreter to load the test class contained in the package student.

Interface statement

An interface is like a class but includes a group of method declaration. This is also an optional section and is used only when we wish to implement the multiple inheritance feature in the program.

Class Definition

A java program may contain multiple class definitions. Classes are the primary and essential elements of a java program. The number of classes used depends on the complexity of the problem.

Main method class

Since every Java stand-alone program requires a **main** method as its starting point, this class is the essential part of a java program. A simple java program may contain only this part.

Java Tokens

- Reserved Keywords
- Identifiers
- Literals
- Operators
- Separators