In Information Technology Computerware divided into two parts:-

1. Hardware.
2. Software.

Software:-Software is collection of program, which developed by following programming languages like C/C++/Java/Python/.Net etc.

There are two types of Software:-

A. System Software.
B. Application Software.

System Software:-The Software which directly interact with Hardware such types of software known as System Software.

Example:-Driver Software, Operating System Software.

Operating System Software:-

It is a platform, where we can run the application software.

It is a bridge between application software and hardware component.

Application Software:-The software which execute on System Software such types of application known as Application Software.

Example:-Mailing Application, Social Media application, Media Player, Editor etc.

Application Software divided into two sections:-

A. Front-End Software.
B. Back-End Software.

Front-End Software:-By using **Front-End** software we can interact with End-User and collect the information form the End-User and stored into Back-End.

We develop **Front-End Software by using Front-End technology language like C, C++, Java, HTML, CSS, .Net etc.**

Back-End Software:- Back-End Software we used to store and maintain data.

We develop **Back-End Software by using Back-End technology language like C, C++, Java, .Net, python etc.**

Language:-Language is a medium through which we can communicate each other, similarly in computerware world we required some language through which end-user can communicate with System that language is known as programming language.

There are two types of programming language:-

A. Law-Level programming Language.
B. High-Level programming Language.

Law-Level programming Language:-

It is System/Machine understandable language.

It is in the binary data code(100010).

It is also known as Machine Language.

High-Level programming Language:-

It is user understandable language like English.

Example:-C, C++, java, .Net, python ...etc.

It is user understandable language.

High level programming language divided into two section:-

A. Interpreter Based **High-Level programming Language.**
B. **Compiler Based High-Level programming Language**

Interpreter vs Compiler:-Both convert high level language to binary code, Both are doing same work but ways of working are different.

Interpreter	Compiler
1.It check the code line by line	1.It check whole from top to bottom.
2.It generate output line by line.	2.It generate output at a time.
3.It show only one error, means if any error occurs remaining line of code will not check.	3.It shows all error from top bottom.
4.It does not generate any exe.	4.It generate exe file.
5.It execute source code directly.	5.It execute exe file.
6.All scripting language required interpreter. Like html, python, perl, shell, javascript.	6.All programming language required compiler. Like C, C++, Java.
7.It is opensource, we can modify any time.	7.It is not opensource.

Except java all other programming language is compiler based.

Source-Code----→Compiler---→Binary-Code----→Processor----→Output

In Java:-

Source-Code-→Compiler-→ByteCode-→Interpreter-→Binary-Code-→Processor-→Output.

Java depending on both compiler as well as interpreter.

Java is runtime interpreter-based programming language.

If any programming language is runtime interpreter-based then exe file will not come into the picture.

In java JVM(java virtual machine) is work as interpreter.

What is java?

The main objective of development of java programming is java is platform independent.

Java is programming language through which we developed application software.

Example:-Mailing Application, Social Media application, Media Player, Editor etc.

Introduction of java:-

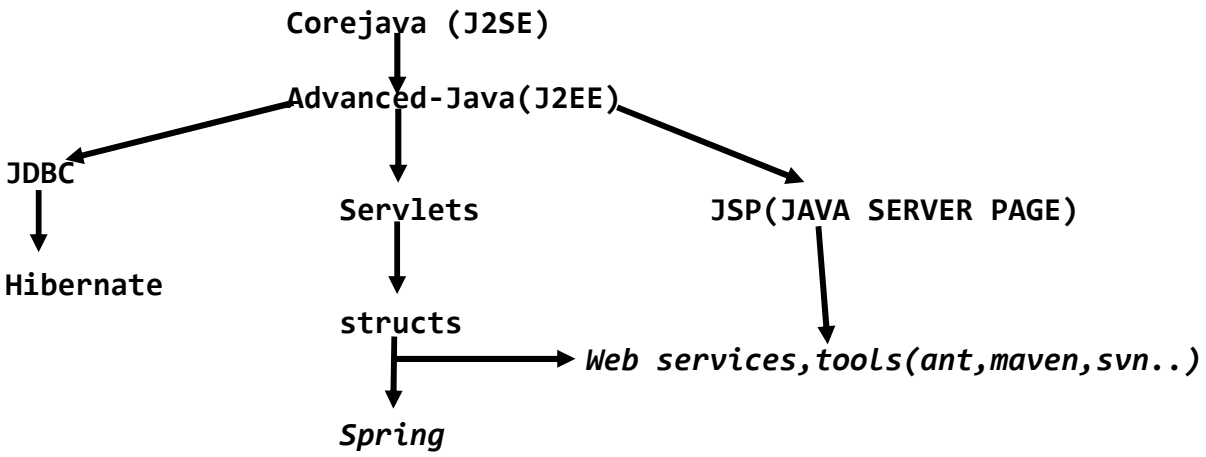
Author	James Gosling
Vendor	Sun Micro System(which has merged into Oracle Corporation)
Objective	To prepare simple electronic consumer goods.
Project name	Green Project
Initial Name	OAK language
Present Name	JAVA
Type of Software	open source & free software
Initial version	jdk 1.0 (java development kit 1996)
Latest Version	Java 18
Implementation Language	C, C++.
Strong Features	Object-oriented, Platform Independent, Robust, Portable, Dynamic, Secure.....
Slogan/Motto	WORA(write once run anywhere)
Extensions	.java & .class & .jar

Parts Of Java:-

As per the sun micro system standard the java language is divided into three parts.

1. J2SE/JSE(java 2 standard edition)
2. J2EE/JEE(java 2 enterprise edition)
3. J2ME/JME(java 2 micro edition)

Learning process of java:-



Technology depends on Java:-

1. Structs
2. Hibernate
3. Spring
4. Selenium
5. Android
6. Cloud computing
7. ADF
8. Hadoop
9. SAP
10. TIBCO
11. Salesforse
12. Webservices

What is the difference between C/C++ and Java?

C/C++	JAVA
1.In C/C++ memory will allocate for primitive data at the time of compilation. So it is static programming language.	1.In Java memory will for primitive data at the time of runtime. So it is dynamic programming language.

2.C/C++ is pre-process, all predefined library will load before the process of class and interface.	2. Java is not pre-process, all predefined library will load into the memory when corresponding class or interface will process.
3.C/C++ is platform dependent language.	3.Java is platform independent language.

What is the difference between pointer variable and reference variable?

Pointer variable	**Reference Variable**
1. Pointer variables are available upto C and C++.	1.Reference variables are available upto JAVA mainly.
2.By using pointer variables refer memory address of object directly.	2.By using reference variable we can access object but not memory address of object.

Java Features:-JAVA has provided the following features.

1. **Simple**
2. **Object Oriented**
3. **Platform independent**
4. **Arch Neutral**
5. **Portable**
6. **Robust**
7. **Secure**
8. **Dynamic**
9. **Distributed**
10. **Multi-Threaded**
11. **Interpretive**
12. **High Performance**

1) Simple:

1)Java is using all the simplified syntaxes from C and C++.
2)Java is simple programming language, because, Java applications will take less memory and less execution time.
3) Java has removed all most all the confusion oriented features like pointers, multiple inheritance..... etc

2) Object Oriented:

Java is an object-oriented programming language, because, JAVA is able to store data in the form of Objects only.

3) Platform Independent:

Java is platform independent programming Language, because, Java allows its applications to compile on one operating system and to execute on another operating system.

4) Arch Neutral: Java is an Arch Neutral Programming language, because, Java allows its applications to compile on one H/W Arch and to execute on any H/W Arch.

5) Portable: Java is a portable programming language, because, JAVA is able to run its applications under all the operating systems and under all the H/W Systems.

6) Robust: Java is Robust programming language, because Java is having very good memory management system like garbage collection and dynamic memory allocation.

7) Secure: Java is very good Secure programming language because of byte code.

To provide explicit security for the Java applications we are having very good predefined library in the form of ***java.security*** package.

8) Dynamic:
Java is dynamic technology it follows dynamic memory allocation (at runtime the memory is allocated).

9) Distributed:-
By using java it is possible to develop distributed applications.

10) Multi-Threaded:-Java provide support of multithreading.

11) Interpretive:
JAVA is both compilative programming language and Interpretive programming language.

12) High Performance:
JAVA is high performance programming language due to its rich set of features like Platform independent, Arch Neutral, Portable, Robust, Dynamic,.....

Steps to prepare First Java Application:

1. **Download jdk-8 for windows operating-system.**
2. **Install Java Software(JDK)**
3. **Set path at environment level.**
4. **Select Java Editor**
5. **Write Java Program**
6. **Save Java File**
7. **Compile Java File**

8. Execute Java Application

Install Java Software(JDK):-We install Java Software(JDK) like normal software, we have not required do any extra thing.

Set path at environment level:-After installation of JAVA software, we have to required set "path" environment variable, through the path we describe the location where all JDK commands are existed that is "C:\Java\JDK1.8.0\bin" and this location to make available all JAVA commands to Operating System.

There are two ways to path:-

1. Command Prompt level.
2. Environment level.

Command Prompt level:-In this open the command prompt and typed
set path=C:\Java\JDK1.8.0\bin;
If we provide "path" set up like above on the command prompt then this set up is available upto the present command prompt only, it is not available to all the command **prompts.**

Environment level:-If we want to set "path" environment variable permanently then we have to use the following steps.

1. Right Click on Computer icon.
2. Select "Properties".
3. Select "Advanced System Settings" hyper link.
4. Click on "Advanced" Tab[By default Selected].
5. Click on "Environment Variables.." button.
6. Goto User Variables part and click on "New" button.
7. Provide the following details.
   variable name: path variable value: C:\Java\jdk1.8.0\bin";
8. Click on "Ok" button.
9. Click on "OK" button.
10. Click on "OK" button.

Select Java Editor:-
Editor is a software, it will provide very good env to write java programs and to save java programs in our system.
EX: Notepad, Notepadplus, Editplus,....etc

Write Java Program:-

```
class Test
{
public static void main(String[] args)
{
System.out.println("First Java Application");
}
```

```
}
```

Save Java File:- class name with .java extension.
Example:-Test.java

Compile Java File:-Compile java file by using following command.

Go to directly where java source is available.

javac source_code_name.java

javac Test.java

After compilation we get .class file which contains byte code.

Execute Java Application:-Execute java application(.class file) by using following command.
java .class_file_name
java Test
Output:- First Java Application