JAVA TUTORIALS-BASIC-NOTES

Programming language:

Programming language is a language used to instruct a machine to perform a specific operation.

Types of languages:

Languages are classified into 3 types

1. Binary language/Low level language
2. Assembly language/Middle level language
3. Programming language/High level language

1.Binary language:

1. It is a language which is understandable by machine. It is also called as machine language

2. Binary language contains only 0s and 1s because machines understand only 0s and 1s. 0 represents logical low and 1 represents logical high

NOTE: Humans can't understand this binary language, hence programmers never use binary language to develop an application

2. Assembly language:

1. It is language which is understandable by microprocessor and microcontroller
2. In Assembly language there are some predefined words such as "ADD", "SUB", "MUL", "MOV" etc.. Know as mnemonics which is converted into low level language with the help of assembler

3. High language:

1. It is a language which is understandable by humans
2. It is very easy to understand, read and write
3. It is programmer friendly language

History of Java:

1. James Gosline is the father of Java
2. JAVA is introduced in the year of 1991
3. The software was named as green talk and development team named as green team
4. Later it was renamed oak. Oak means strength and national tree of Germany

5. There was already existing company with the name oak technologies which has raised a legal issue because of that oak has been converted into Java and the team's name also changed to sun micro systems

6. We can run Java on any platform like Windows, Linux, Mac....

Features of Java:

1. Simple
2. High performance
3. Object oriented
4. Portable
5. Multi-threading
6. Robust
7. Platform independent

Simple:

Java is called a simple programming language because it is developed using the English language along with numbers 0-9. To learn JAVA, another programming language is not required.

High performance:

Java is called a high-performance language because it takes less time to execute/run and less space to store the program.

Object oriented:

Java is object-oriented programming because in java we consider each and every thing as an object (object means block of memory).

Portable:

Java is called a portable programming language because it can be run on any platform.

Multi-threading:

In Java thread is nothing but a program so we can run multiple programs at a time.

Robust:

In English robustness is nothing but strong. Similarly Java can handle any errors by itself without damaging the software.

Platform independent:

Java's portable futures makes the platform independent, irrespective of the device Java will provide required output.

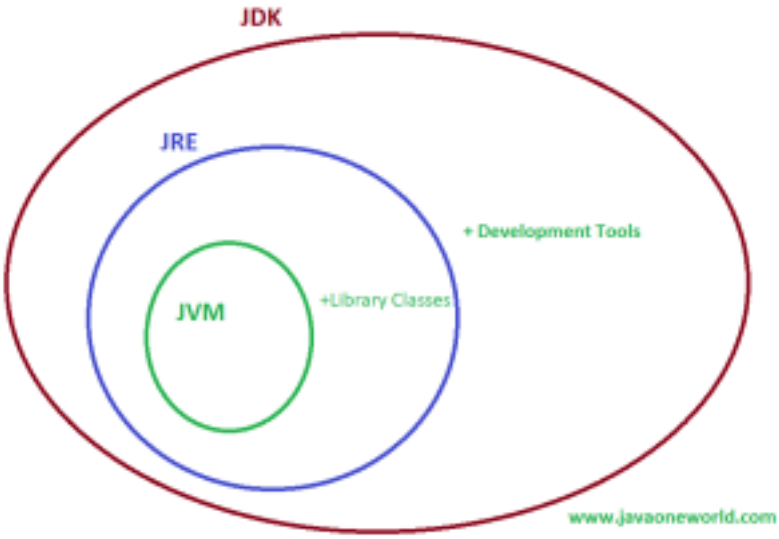
JAVA ARCHITECTURE

Java Architecture is a collection of components, i.e., **JVM, JRE,** and **JDK**. **It** integrates the process of interpretation and compilation. It defines all the processes involved in creating a Java program. **Java Architecture** explains each and every step of how a program is compiled and executed.

JDK: JDK stands for Java Development kit, it is used to develop and run an application. Inside JDK we have JRE and development tools like compiler

JRE: JRE stands for Java Runtime Environment, it provides an environment to run an application. Inside JRE we have JVM and inbuilt libraries

JVM: JVM stands for Java Virtual machine, it is used to execute the code, JVM will be executed line by line. Inside JVM we have class loader, execution engine, memory management.



Compiler

Compiler is a component in java it always checks for syntax. If the program is syntactically correct the compiler will convert .java to .class file. If the program is not syntactically correct the compiler will show an error saying compile time error.

Source file

File generated by a programmer which contains instructions in the Java language is known as

source file. Each and Every source file always has an excavation called .java.

Class file

A file generated by the compiler is known as a class file. Class file contains instructions in bytecode. Each and Every class file should always be executed with .class.

Byt Code

It is an intermediate language generated by a compiler; it is neither understandable by humans nor by machines.

Tokens

Tokens are the smallest unit in java, we are tokens to perform same operation

1. Keywords

Keyword is a predefined word which is used to perform specific tasks, in java we have 50+ keywords. We can't change keyword name or meaning. Each and every keyword has a specific function.

NOTE: All keywords are in lower case

Ex: int, else, if, class, for, switch

2. Identifier

Identifiers are the naming words which are used for identification purpose

Rules to use identifier

1. Identifier never start with digit
2. Keywords are not allowed to be identifier
3. Space is not allowed
4. Special characters are not allowed except $ (Dollar) and _ (Underscroll)

Ex: Demo, $if, 123@demo

NOTE: We are using identifiers as classname methodname and variable

3. Literals / Data

Literals are nothing but data which is used JAVA programming language.We have 4 types of literals

1. Number Literals (Integers and Float)
2. Character Literals
3. String Literals
4. Boolean Literals

4. Separators

Separators are used to separator the code

Ex: Braces { } , Brackets [ ] , Parentheses ()

5. Comments

Comments are used to express the function / code. They are two types of comments

1. Single line , it is represented by //
2. Paragraph , it is represented by /* —*/

6. Commands

1. Javac : This command is used to compile the source code
2. Java : This command is used to rub the bytecode
3. cd : This command is used to change current directory to forward directory
4. cd.. : This command is used to change current directory to back directory
5. md / mkdir : This command is used to make directory
6. cls : This command is used to clear the screen

STRUCTURE OF JAVA PROGRAM

```java
public class HelloWorld {
    // Entry point of the program
    public static void main(String[] args) {
        // Your program logic goes here
    }
}
```

Keywords : class, public, static, voide

Identifier : Class_Name (HelloWorld), main

> **N0TE :** Class_Name always starts with uppercase character. If Class_Name is multi word then every word starts with uppercase character.

PRINTING STATEMENTS:

Printing statements in Java are used to display information, messages, or values to the console or another output device. The most common way to print a statement in Java is by using the System.out.println() and System.out.print() methods. Here's how you can use it:

```java
public class PrintStatementExample {
    public static void main(String[] args) {
        // Print a simple message
        System.out.println("Hello, World!");
        System.out.print("Welcome to java programming");

    }
}
```

println :

Stands for "print line." Prints the specified text or data to the console (standard output) and adds a newline character (\n) at the end. After printing, the cursor moves to the beginning of the next line, so subsequent output appears on a new line. Useful when you want to display messages or data on separate lines.

print:

Simply prints the specified text or data to the console without adding a newline character. The cursor remains on the same line after printing, so any subsequent output will appear on the same line.

NOTE : We can compile a class without main method only when class block is empty but we can’t run the class without main method even it is empty

```java
public class EmptyClass {

}
// We can compile but we can't run
```

```java
public class EmptyClass {
  System.out.print("Hello, ");
  System.out.print("World!");
}
// We can't compile and We can't run
```