# Java Technologies

J2SE

J2EE

J2ME

**J2SE:** J2SE stands for Java2 standard Edition. Used to develop client applications

**J2EE:** J2EE stands for Java2 Enterprise Edition. Used to develop server applications.

**J2ME:** J2ME stands for Java2 Micro Edition. Used to develop mobile applications.

**History of Java:** In the 1991 a language called OAK was developed by James Gosling & Patrick Naughton with some other programmers at Sun Microsystems, U.S.A. OAK was developed to program Home appliances like TV, Washing Machines, Refrigerators etc. Later on 23rd January 1996 a programming language named as JAVA was introduced. It is targeted to main stream systems.

**Features of Java:**

1. Java is **simple** because it derive its syntaxes from C and OOPs concepts from C++, Smalltalk, Ada. No pointers concept and complicated concepts like multiple inheritance thru classes. These are implemented differently.
2. **Portable:** It is 100% portable language. Portability is due to Byte code. Java’s slogan is write once and execute any where.

**Java**

**Source Code**

**compiler**

**Byte Code**

OS/9

MAC

VSAM

M/F

Windows

PIV

JVM for JVM for JVM for

Windows Main Frame Machitosh

\*\*What is the difference between .exe file and a .class file?

--------------------

Ans:

------

\*\*.Exe file contains machine language instructions understandable by micro processor.

.class file contains byte code instructions understandable by the JVM(JAVA VIRTUAL MACHINE).

.Exe file is System dependent.

.Class file is System Independent.

\*\*JVM is system dependent.

MAJOR SECURITY PROBLEMS FOR DATA ON INTERNET:

----------------------------------------------------------------------------------

1.EAVESDROPPING:

-----------------------------

Reading others data illegally is called Eavesdropping.This is the major problem.

2.Tampering:

------------------

Not only reading others data but also modifying is called Tampering.

3.Impersonation:

-----------------------

A person acting as another person on internet is called Impersonation.

4.Virus:

------------

Virus is a harmful program that can damage data,s/w, and h/w of a computer system.

1. **Robust:** Java programs can run on all types of environments because
   1. It is strictly typed language
   2. It can manage memory thru Automatic garbage collector.
   3. It can handle run-time errors thru exception handling.

**4.OBJECT-ORIENTED:-**

**-------------------------------**

Unlike c++,Java is a purely object oriented prgming lang.Java programs use objects and classes.

**5.DISTRIBUTED:-**

**---------------------**

Information is distributed on various computers on a network. Using Java, we can write programs which capture information and distribute it to clients.

**6.SECURE:-**

**-----------------**

Java enables the construction of virus free and tamper free system.

**7.ARCHITECTURE NEUTRAL:-**

**----------------------------------------**

Java's byte code is not machine dependent.

It can be run on any machine with any processor and with any O/S.

**8.INTERPRETED:-**

---------------------------

Java prgms are compiled to generate the byte code. This byte code can be downloaded and interpreted by the interpreter in JVM.

**9.HIGH PERFORMANCE:-**

-----------------------------------

Along with interpreter,there is JIT compiler in JVM which enhances the speed of execution.

**EX:-** BASIC

But compared to compiled languages it is slower. To boost the performance you can JIT (Java In Time Translator).

**10.MULTITHREADED:-**

------------------------------

We can create several processes in Java, called 'threads'. This is an essential feature to design server side prgms.

**11.DYNAMIC:-**

--------------------

We can develop prgms in java which dynamically interact with the user on Internet(ex:applets)

## Programming Methodologies

OBJECT ORIENTED

PROGRAMMING

EVENT DRIVEN

PROGRAMMING

PROCEDURAL

PROGRAMMING

**OOPs Conecpts:**

**1.Encapsulation(Binding):** Binding the related data members(variables) and member functions(methods) in to a single entity is called Encapsulation. Classes use Encapsulation concept.

**2.Abstraction(Hiding):** Abstraction allows hiding unwanted details from external programming. In oops a clearly designed program can reveal only such data that is required by external world. Here we create objects that communicated with each other by passing messages.

**3.Polymorphism(Multiple behavior):** In oops an object can behave differently for each type of parameters passed, it responds accordingly depends upon the parameters or the context. This is called polymorphism.

**4.Inheritance:** Inheritance is process where one class acquires the data members and member functions of another class. Inheritance lets you add new modifications to the software without actually modifying the software.

**5.Class:** The fundamental unit of java programming is class. A class serves as blue print and provides the architecture of an object. Class is logical entity. Objects are created from class. These objects are physical and exist in the memory. All objects are instantiated from a class share similar features. The objects communicates with each other through interfaces (public methods). Any no.of objects can be created from a single class. The class provides encapsulation and abstraction

**Character set of Java:**

Alphabets – a to z and A to Z

Digits – 0 to 9

Special Characters- +,-,\*,/,%,(,),>,<,=,!,| etc

**Reserved words:** Reserved word is a word that has a predefined meaning in the complier. We should not use these reserved words for other purpose except for which it is designed. There are 49 reserved words in J2SD1.4 version.

Ex:- **public, private, protected, for, while etc.**

**Variable:** The value of the object, which changes during the execution of the program, is referred as a variable. Sytax to declare a variable in Java as follows:

<Datatype> <variable>[=<value>];

**Constant or Literal:** The value of the object, does not which changes during the execution of the program, is referred as a constant. The following are the different type of constants available in java.

1. Integer constants. 2. Float constants. 3. Double constants.

4. Character constants. 5. String constants.

**Data Types:** There are 9 primitive data types in Java. They are:

Data type width(in bytes) Range

------------ ------------------ --------

byte 1 (or) 8 bits -128 to +127

short 2 (or) 16 bits -32768 to +32767

int 4 (or) 32 bits -2147483648 to +2147483647

long 8 (or) 64 bits -9223372036854775808 to

+9223372026854775807

float 4 (or) 32 bits 1.4e-045 to 3.4e+038

double 8 (or) 64 bits 4.9e-324 to 1.8e+308

char 2 (or) 16 bits 0 to 65535

boolean ------ true/false

void ------ -----

**Operators:** The following are the different categories of operators available.

**1. Arithmetic operators:** These operators are use to perform arithmetic operations. The following are the different types of arithmetic operators available.

+ (addition) /= (Division Assignment)

- (Subtraction) %= (Modulus Assignment)

\* (Multiplication)

/ (Division)

% (Modulus)

++(Increment)

-- (Decrement)

+=(Addition Assignment) a= a+b; a += b;

-=(Subtraction Assignment)

\*=(Multiplication Assignment)

**2.Relational Operators:** These operators are used to perform relational operations.

< (Less than)

> (Greater than)

<= (Less than or equal)

>= (Greater than or equal)

!= (Not equal)

== (Comparison operator)

**3.Logical Operators:** These operators are used to perform logical operations.

&&(and)

|| (or)

! (not)

**4.Assignment Operator:** =

**5.Bitwise Operators:** These operators are used to perform bitwise operations. The following are the different bitwise operators.

& (Bitwise and)

| (Bitwise or)

! (Bitwise not)

<<(Left shift operator)

>>(Right shift operator)

**6.Conditional Operator:**  ?: it is also called ternary operator .

sytax: (expression1)?(expression2):(expression);

**Comments:** Comments are the non-executable statements. Comments increases the readability of the program. Java allows two types of comments. They are:

1. multiple line comments should be enclosed between /\* and \*/
2. // - single line comment