



Java Language

Notes

DEMO

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* Language:

A programming language is a formal language that is used to communicate instruction to a computer.

- A programming language consists of a set of rules, symbols and syntax that allow programmers to write code that the computer can understand and execute.
 - Programming languages are used to create software and applications, automate task and solve problems. They enable programmers to write code in a more human-readable and understandable format which is then translated into machine readable binary code that the computer can execute.
 - There are many different programming language, each with its own syntax and semantics and each designed for specific types of task or applications. Some of the most popular programming languages include java, python, c++, javascript, Ruby and PHP.
- * Programming languages are often classified into different categories -
- Here are the three main categories of programming languages -
- i) Low-level languages -
These are programming language that are designed to be used directly with computer hardware.
Eg:- Assembly language, machine language

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2. Middle-level languages -

These programming languages are combine elements of both low-level and high-level languages.

Eg:- C and C++

3) High-level languages -

These are programming languages that are designed to be easy to use and understand, with a focus on code readability and productivity. It is more portable and easier to learn than low-level languages.

Eg:- Java, Python, Ruby and JavaScript

* Programming Paradigm -

Style of writing programs and codes

(Way of organising the programme)

i) Monolithic Programming

ii) Procedural or Modular programming

iii) Object Oriented programming

Introduction of Java

- Java is a high-level programming language.
 - It was developed by Sun Microsystem (now owned by oracle) in the mid 1990.
 - Java is an object-oriented language that uses objects to represent data and functionality.
 - Java's main principle is "Write once, run anywhere" (WORA), meaning that java code can be written on one platform and run on any other platform that supports java.
- * Some important points of java -
- Author : James Gosling
 - Vendor : Sun Microsystem (Now owned by oracle)
 - Project name: Green Team
 - Initial name : Oak (changed in 1995)
 - Present name : Java
 - Type : Open source
 - Extentions : .java (Source code),
.class (compiled code),
.jar (archive)
 - Present version: Java 18
 - Operating System : Any operating system with a JVM
WORA (Write once run anywhere)
 - Principle :

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- * First program using Notepad and compilation and execution through CMD -

```
import java.lang.*;  
Public class MyFirst  
{  
    Public static void main(String args[])  
    {  
        System.out.println("Hello World");  
    }  
}
```

- Steps for execution and compilation -

- i) Save the file (Write file name in double quote)

Eg:- "MyFirst.java"

Note - While saving the file, use same name as class name. (MyFirst)

- i) Go to command prompt -

→ Write javac MyFirst.java for compilation process.

(If some errors are occur then it would show)

- After compilation, if we check the directory then there are two files are it will be there -

- 1) MyFirst.class (This file generated by compiler)

- 2) MyFirst.java (This is that file which we have written.)

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iii) Write [java MyFirst] for running the program.

→ It will print Hello world

* Exploration of skeleton of java program -

- import java.lang.*;
It imports the java packages file.
- class is a keyword is used to declare a class in java.
- Public keyword is an access specifier which represents visibility, it means it is visible to all.
- static is a keyword, if we declare any method as static, it is known as static method. The main advantage of static method is that there is no need to create object to invoke the static method.
- void is the return type of the method, it means it doesn't return any value.
- main is a method, it represents startup of the program. The main method is executed by the JVM.
- String args[] is used to command line argument.

String - 'S' is capital

→ It can be written in 3 ways -

- 1) String args[]
- 2) String [] args
- 3) String []args

Data types and Variables

* Data types -

Data type is used to specify the type of data that a variable can hold.

- Variables are meant to store data.
- Data is stored only after the variable is declared.
- Data can be both sign and unsigned.
- Any information is called as data.
Eg:- name, age, marks etc.

* There are two types of data type in java -

1) Primitive data types (Basic data types)

These data types are categories into four parts -

a) Integral - Have any numerical value without decimal point.

→ Integral data type is divided depending on the size :

Name	Size	Range	Default
- Byte	1	-128 to 127	0
- short	2	-32768 to 32767	0
- int	4	-2147483648 to 2147483647	0
- long	8	—	0

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Conditional Statements

- * In java, conditional statement is a type of control structure that allows the program to make decisions based on certain conditions.
- * Java supports the following conditional statements-
 - i) if statement -

The if statement is used to execute a block of code if a condition is true.

syntax:

```
if (condition)
{
    //code to execute, if "cond" is true
}
```

Eg:-

```
Public class Test
{
    Public static void main(string a[])
    {
        int x = 10;
        if (x > 5)
        {
            S.o.P("x is greater than 5");
        }
    }
}
```

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Looping Statement

- * It is a block of statement that performs set of instructions.

"The looping is a process of repeating a single statement or group of statement until some condition for termination of loop is satisfied".

- * Types of loops -

- i) while loop -

When we want to do something a fixed no. of time but not known about the no. of iteration in a program then while loop is used.

In this loop, first condition is checked, if it is true, body of the loop is executed otherwise control will be come out of the loop.

Syntax:

```
while (condition)
```

```
{
```

```
    // code to be executed repeatedly
```

```
}
```

Java Arrays

- * Array is a collection of similar data items or elements.
- * It is used to store group of data simultaneously.
- * It can store data of same data type means an integer array can store only integer value, character array can store only character value and so on.
- * Each location of an element in an array can be accessed by using their index.
- * Every array in java has 'length' as its property which can be accessed by using ~~array~~.

arrayName.length → It give the length of the array.

Types of Array -

i) One-Dimensional Array -

→ Declaration of one dimensional - Array

```
int A[];  
A = new int[5];
```

or,

```
int A[] = new int [5];
```

String

- * String is a built-in class available in java that represents a sequence of characters.
- * String is predefined class which is present in "java.lang" package.
- * In java, all classes are also considered as data types. So we can take string as a data type also.
- * A class is also called as user-defined data types.
- * In java string is an -
 - object
 - data type
 - class
 - group of characters.

Creating Strings:

There are two ways to create strings in java -

- i) Using new keyword
- ii) Using string literal