

3. JVM (Java Virtual Machine):

- o The **JVM** is a crucial part of both the JDK and JRE.
- o It serves as an **interpreter** for Java programs.
- o Key points about JVM:
 - It executes Java programs **line by line**.
 - JVM is responsible for converting Java bytecode into machine-specific instructions.
 - Whenever you run a Java program, an instance of JVM is created.

4. JIT (Just-In-Time Compiler):

- o The **JIT** is a dynamic component within the JVM.
- o It **optimizes** the execution of Java programs.
- o How it works:
 - When a Java program starts executing, the JIT compiles parts of the bytecode into native machine code.
 - This compilation happens **on the fly**, improving performance during runtime.

Hope you understand how JVM works Internally

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

But above we write a JAVA code, right?

Here you use class Test or something code What is the meaning about this line of code??

Now we learn rules or syntax to write JAVA code 

1. Class Definition:

```
class Test {
```

```
//statement  
}
```

This line uses the keyword **class** to declare that a new class is being defined.

And contain **Test** It is an identifier that is the name of the class and define definition of class with the help of {curly brace}

2. main Method

```
public static void main(String []args)
```

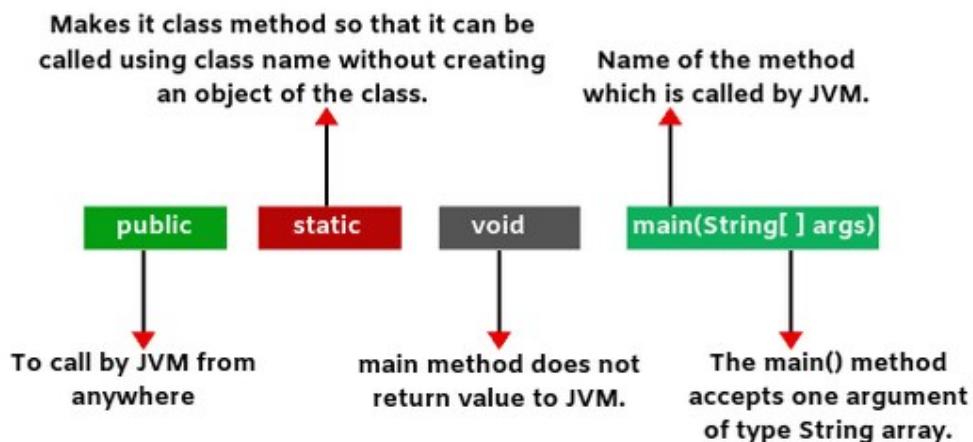


Fig: Java main method

3. `System.out.println("My First Java Program.");`

This line outputs the string **“My First Java Program.”** followed by a new line on the screen. Output is accomplished by the built-in `println()` method. The **System** is a predefined class that provides access to the system and **out** is the variable of type output stream connected to the console.

Hope you understand how to write java code

JAVA Data Types

Java is statically typed and also a strongly typed language because, in Java, each type of data (such as integer, character, hexadecimal, packed decimal, and so forth) is predefined as part of the programming language and all constants or variables defined for a given program must be described with one of the Java data types.

What is DATA type?

Datatype specify the different sizes and values that can be stored in the variable. Java has two categories in which data types are segregated.

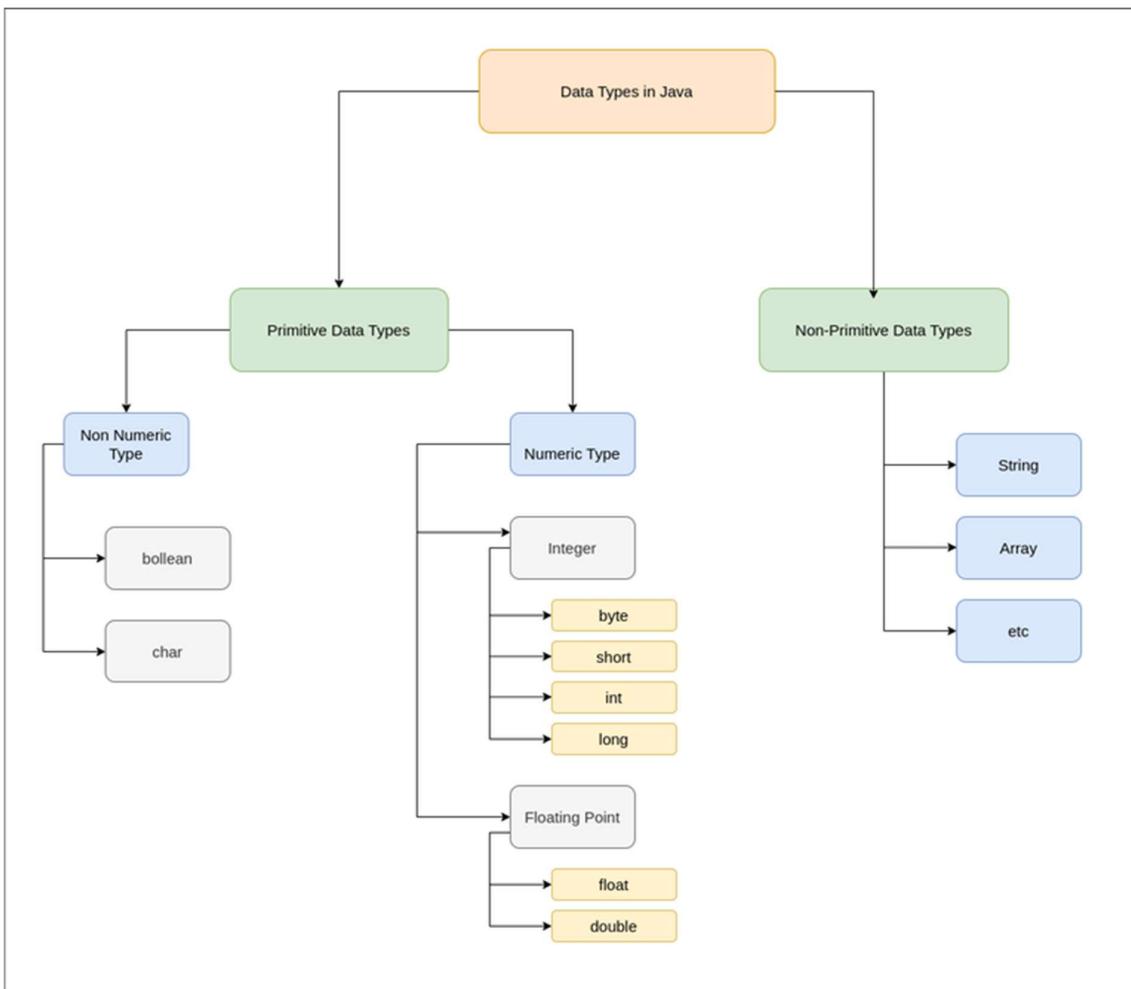
1. Primitive Data Types:

- These are the fundamental building blocks in Java. They include:
 - byte: An 8-bit integer that stores whole numbers from -128 to 127.
 - short: A 16-bit integer for whole numbers ranging from -32,768 to 32,767.
 - int: A 32-bit integer capable of storing whole numbers from -2,147,483,648 to 2,147,483,647.
 - long: An 64-bit integer that accommodates whole numbers from -9,223,372,036,854,775,808 to 9,223,372,036,854,775,807.
 - float: A 32-bit floating point type for fractional numbers (approximately 6 to 7 decimal digits).
 - double: A 64-bit floating point type for more precise fractional numbers (approximately 15 decimal digits).
 - char: A 16-bit Unicode character representing a single letter or symbol.
 - boolean: A 1-bit type that stores true or false values.

2. Non-Primitive Data Types:

- These are more complex and include:
 - String: Represents sequences of characters (text).
 - Arrays: Collections of elements of the same type.
 - Classes: User-defined data types that encapsulate data and methods.

- Interfaces: Blueprint for classes to implement.



What is type casting in java?

→ Converting one datatype to another datatype is called type casting.

Two type of type casting in java

1. **Implicit type casting**
2. **Explicit type casting**

Implicit type casting:

it is automatically performed by the compiler

Explicit type casting:

By default, the compiler doesn't allow the explicit type casting.

For example: double x=10.5;

```
int y=(int)x;
```

variable

variable is the name of the memory location.

In other word we can say it is used define name which is given by user.

Variable can store on type of value.

Ex:- int a=10

Here a is the variable.

Type:

Three types of variables are in java there are

Local variable:

A variable which is declared inside the body of the method or method parameter call local variable.

Syntax:

The image shows handwritten code in blue ink. It starts with 'void fun () {'. An arrow points from the opening parenthesis to the word 'local variable.'. Below this, there is a line of code 'int x; // local variable' followed by a closing brace '}'.

Instance variable:

A variable which is declared inside the class but outside of all the methods call instance variable.

- As instance variables are declared in a class, these variables are created when an object of the class is created and destroyed when the object is destroyed.
- Unlike local variables, we may use access specifiers for instance variables. If we do not specify any access specifier, then the default access specifier will be used.
- Initialization of an instance variable is not mandatory. Its default value 0.
- Instance variables can be accessed only by creating objects.

Static variable:

A variable written to declared with the help of static keyword call static variable.

Syntax: static int x;