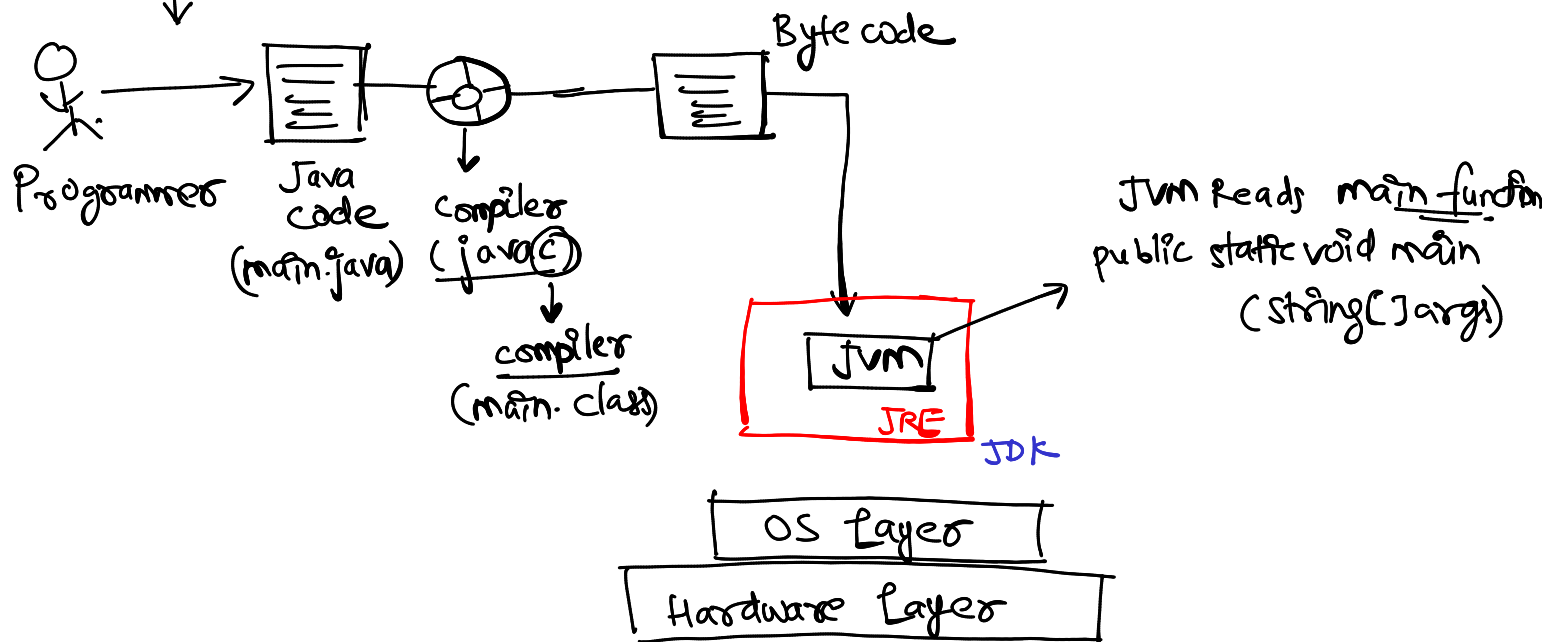


## How Java works?



Programmer writes java code(Main.java) and compile it with compiler(javac) , which converts the program into byte code(Main.class) , which is being understood by the computer and since JVM is responsible for running the program and whole process, it looks for entry point(Main class) through which it can start executing the program. JVM needs some environment in which it can execute the java program which is called as JRE(it has some existing files which helps to run the java program), and all this can be available inside a kit which is known as JDK(which comprise of both JVM and JRE)

Java is platform Independent ,that means it can run on any operating system , but JVM is platform dependent , that means for every OS , there will be a different type of JVM which is needed to run Java

javac- java compiler

Byte Code - which is converted by the compiler for computer to understand the code written by programmer

JVM - Java Virtual Machine

JRE- Java Runtime Environment

JDK- Java Development Kit

# Datatype, variable and Literals

int x = 5;

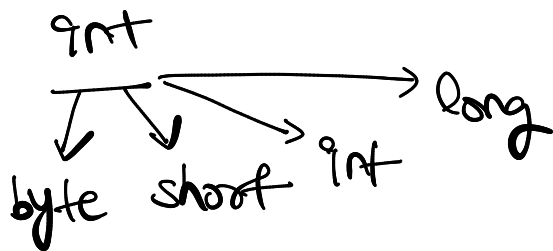
Datatype

## Primitive Datatypes

- int
- float
- char
- boolean

## Non Primitive Datatype

- Arrays
- Strings
- classes
- objects
- interfaces



1 byte = 8 bit

bit is like atom  
(smallest unit to store any kind of data).

Range  $\rightarrow -2^{x-1}$  to  $2^{x-1} - 1$  where (x = no. of bits)

byte = 8 bits  $\rightarrow -2^{8-1}$  to  $2^{8-1} - 1 = \boxed{-2^7 \text{ to } 2^7 - 1}$

short = 2 byte =  $2 \times 8$  bits = 16 bits  $\Rightarrow -2^{16-1}$  to  $2^{16-1} - 1$   
 $= \boxed{-2^{15} \text{ to } 2^{15} - 1}$

int = 4 byte =  $4 \times 8$  bits = 32 bits  $\Rightarrow -2^{32-1}$  to  $2^{32-1} - 1$   
 $= \boxed{-2^{31} \text{ to } 2^{31} - 1}$

$$\begin{aligned} \text{long} &= 8 \text{ byte} = 8 \times 8 \text{ bits} = -2^{64-1} \text{ to } 2^{64-1} \\ &= 64 \text{ bits} \\ &= \boxed{-2^{63} \text{ to } 2^{63}-1} \end{aligned}$$

Default value for integer type data type is "int".

---

float  
 ↙ ↘  
 float double

$$\text{float} = 4 \text{ byte} = 4 \times 8 = 32 \text{ bits} \quad (\text{upto 7 decimal digits})$$

$$\text{double} = 8 \text{ byte} = 8 \times 8 = 64 \text{ bits} \quad (\text{upto 14 decimal digits}).$$

Default value of float data type is "double".

---

char

$$\begin{aligned} \downarrow \\ \text{char} &= 2 \text{ byte} = 2 \times 8 = \underline{16 \text{ bits}} \quad \left( \begin{array}{l} \text{it stores UNICODE, not} \\ \text{ASCII code} \end{array} \right) \end{aligned}$$


---

boolean

↓  
 It stores only 2 type of values (true/false)

$$\text{boolean} = 1 \text{ byte} = 8 \text{ bits}.$$


---

How to deal with default values :->

Long a = 2436l; ( 'l' and 'f' should be explicitly  
float b = 2.43f; mentioned to denote datatype )

---

Primitive Datatype



pre-defined

eg: int, float, char, boolean  
[Already written in language]

Non-Primitive Datatype



( user-defined data type )

eg: class, objects, arrays, strings.