Java

DATE 25 8 21 PAGE NO 1

Java is programming lang. and computing platform released by "sun Microsystems" in 1995.

- Java is OOP language. (object oriented programming)
  ! It is not 100% oop lang. It is about 90-95%.

! Programming: set of instructions to perform a specific task.

Main parts
- OOPs (object oriented programming)
1. Class.
2. Object.
3. Encapsulation.
4. Inheritance.
5. Abstraction.
6. Polymorphism.

- OOP generally contains
  Integer i = new Integer(10);
  This is very rarely used.
  we commonly used `int x = 10;`
  Due to some of these reasons it is not 100%. oops language.

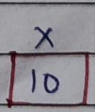
- Class : Set of variables and methods.
- Variable: is used to store some values.

  x = 10

  x ⇒ variable name or identifier.

  = ⇒ Assignment operator.

  10 ⇒ value or literals.

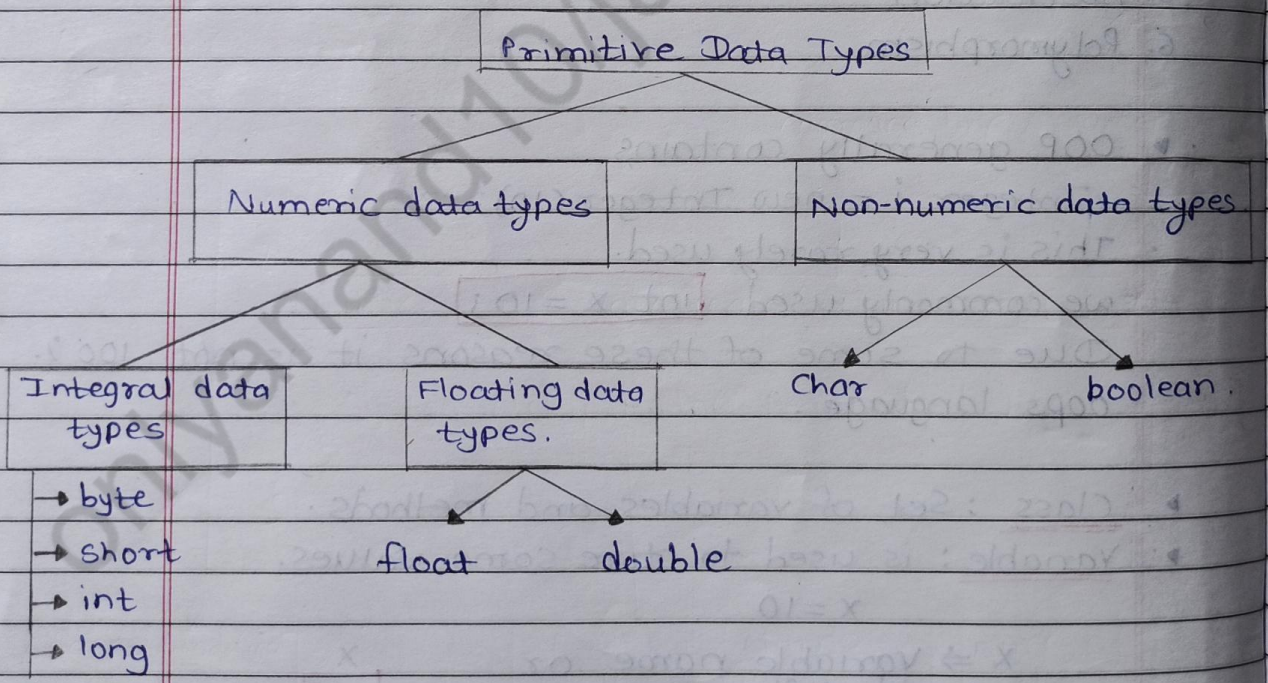


- Types of variables :-

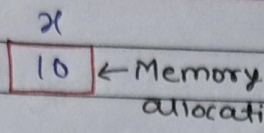
1) Instance variable
2) Static variable
3) Local variable

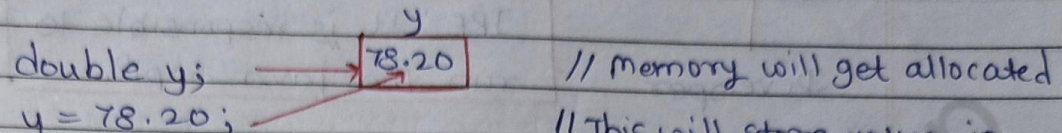
⊙ Data types
1) Primitive data types.
2) Non-primitive data types.

1) Primitive data types. (Intrinsic)
! Java is staticaly typed language. Means that all the variables must first declared before they can be used.

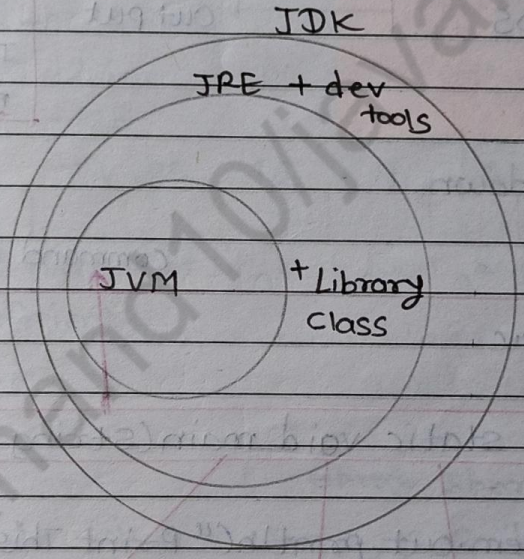


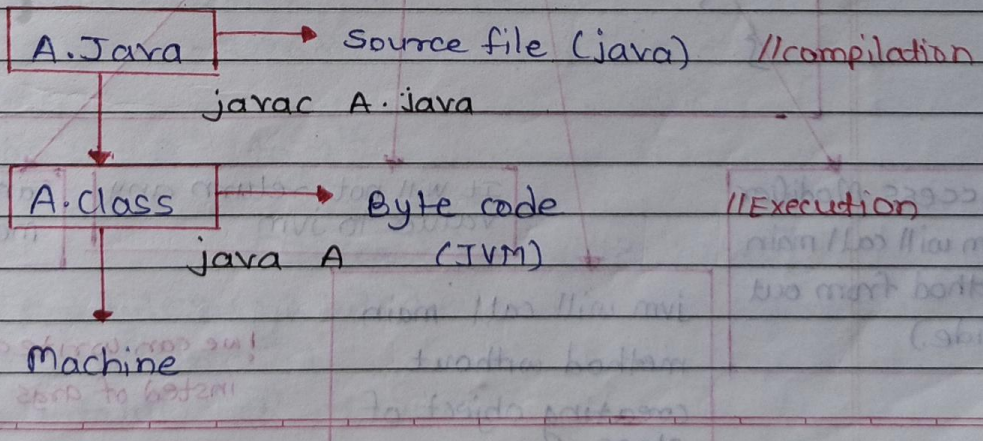
int x; → Declaration
x = 10; → Initilization



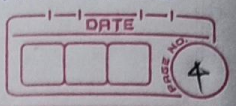


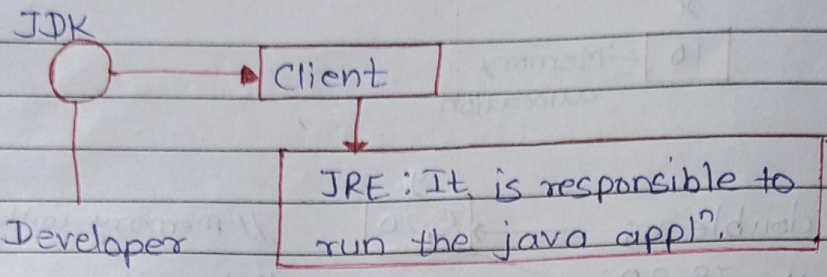
- JDK (Java Development kit)
  - Develope and execute java applications.
- JRE (Java Runtime Environment)
  - To execute java apps only.
- JVM (Java virtual Machine)

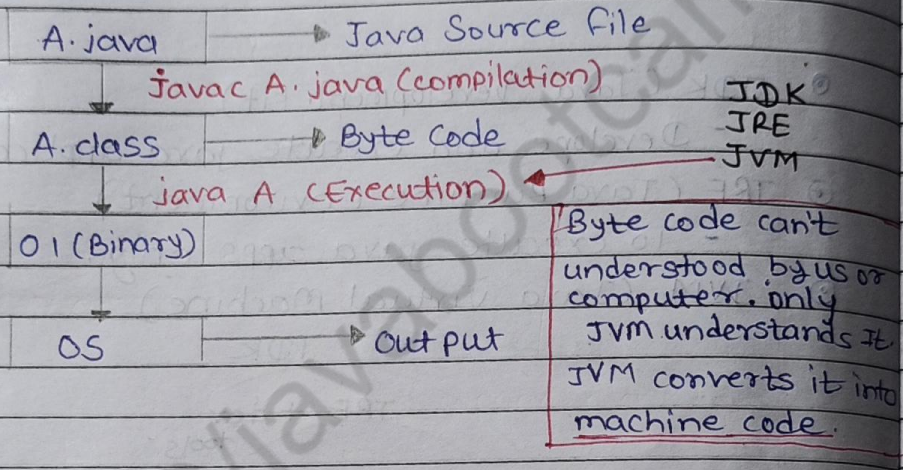




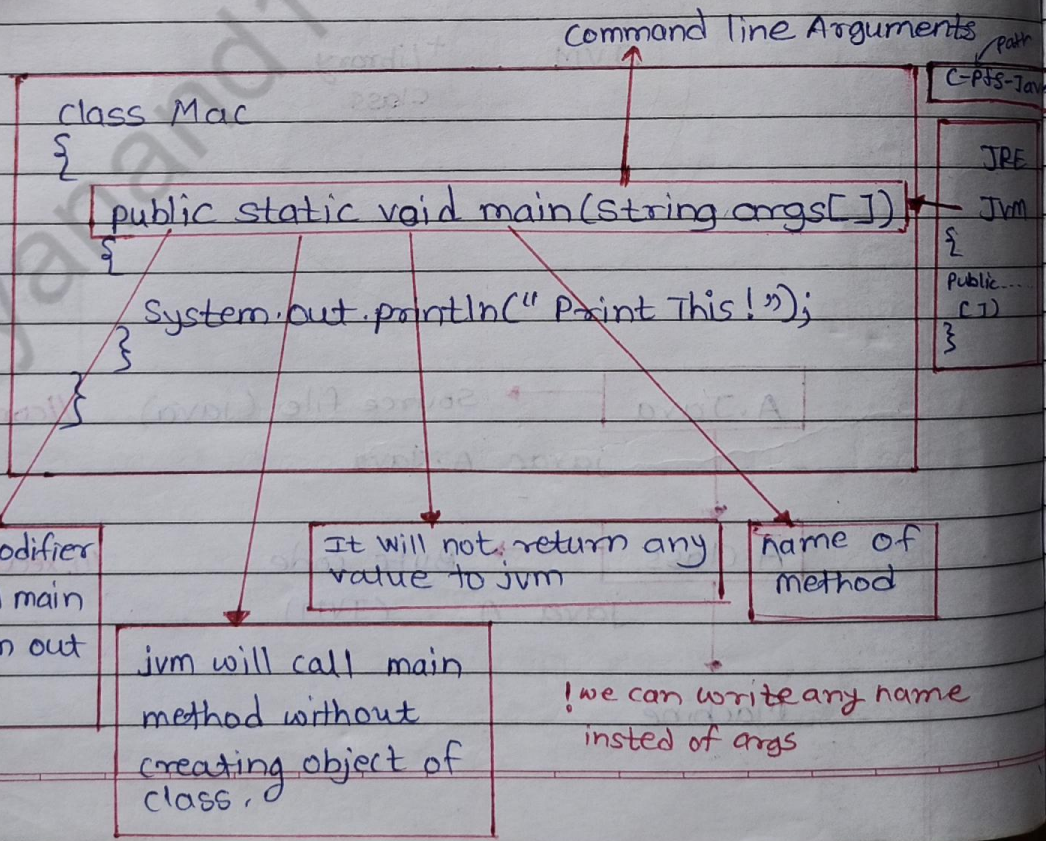
* We can run java code without main method. Not all code bt some codes can be run in 6 and its previous versions.







* Code breakdown.



✱ Variable types

1) Instance variables
2) Static variables.
3) Local variables.

◉ Before this Lets check some data types :-

◉ primitive datatype

* Integral data types

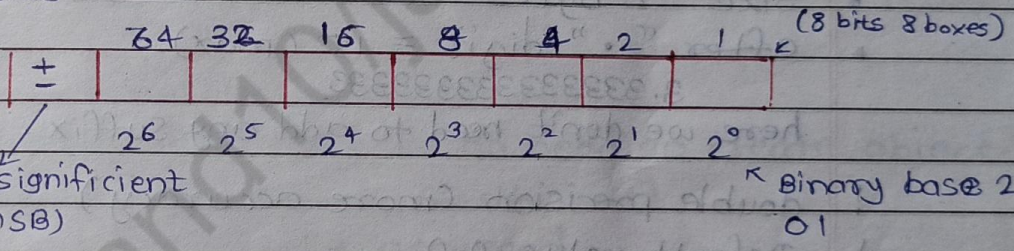
1) byte

Byte → Wrappe class

Size : 1 byte (8 bits)

Max value : 127

Min value : -128



2) Short [~~Shrot~~ Short wrapper]

- In Java short size is 2 byte (16 bits)
- Max value = 32767
- Min value = -32768

Range : -2^{15} to $2^{15}-1$

3) int [Integer = wrapper class]

- Size = 4 bytes (32 bits)
- Range : -2^{31} to $2^{31}-1$
- Default value '0'

Wrapper class in java provides the mechanism to convert primitive into object into Primitive.

4> long (Long - wrapper class)
- Size : 8 bytes (64 bits)
- Range : -2^{63} to $2^{63}-1$

* Floating point

5> Float (Float wrapper class)
- Size : 4 bytes
- after "." digit = 6 (max)
  3.333333f
  we have to add this "f" as suffix.
- ! Single precision (less accuracy)
- Default value 0.0

6> ~~Double~~ double (Double wrapper class)
- Size : 8 bytes
- after "." digit = 15 (max)
  3.333333333333333
  here we don't need to add any suffix.

! double precision (more accuracy)
! Default value 0.0

wrapper class contain various methods like
.MAX_VALUE()
.MIN_VALUE, etc.

* Non numeric data types

7> char (~~char~~ Character wrapper class)
- size : 2 byte
- In java char have size of 2 bytes bec it supports unicode.
  means we can give value to char in various languages.

! Default value ' ' (space)

8> boolean (Boolean wrapper class)
- size : 1 bit 0 1
- It only have true or false value.

! Default value 'false'

⊙ Variables :

- A variable is an container that stores a value like bottle is container and water in that bottle is value.
- This value can be changed during execution of program.

Example :- `int num = 10;`
- int → Data type
- num → variable
- 10 → value.

* Types of variables
1) static variable
2) Non-static / instance variable.
3) Local variable.

① Static variable
- To access this there is no need to create object of that class to access this.
- It can be directy accessed.
- Eg. `static int a = 20;`

② Non-static / instance variable.
- To access this instance variable we first need to create an object of that class only then we can access it.

③ Local variable
- Local variable is declared only in method.
- we must have to assign value to local variable while declaring it.

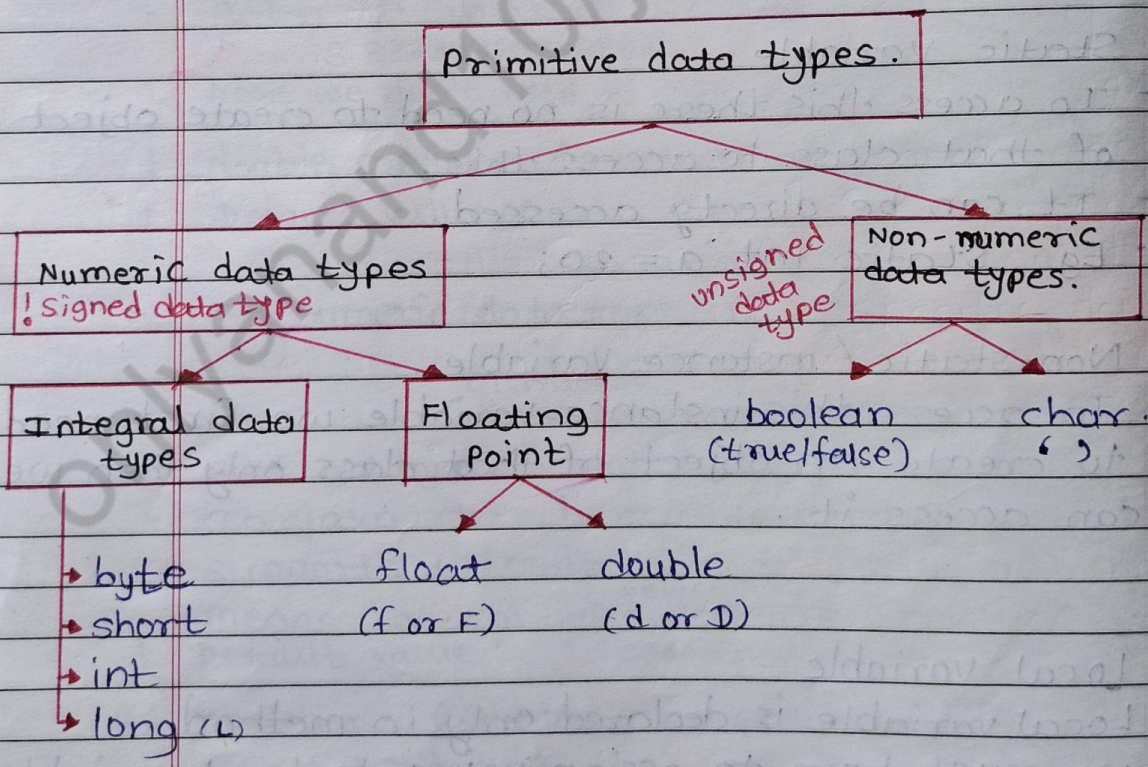
- We can't use local variable outside of that method.

How System.out.println( ); works

! This is inbuilt

```
class System{
        static PrintStream out;
}
```

+ System → class
+ out → static variable having return type PrintStream.
+ println → method (to print the output)



- Before using these we must need to find the type of data we want to store.
- After that we need to analize the ~~main~~ min and max values we might use.

⊙ Litrals

A constant value which can be assigned to the variable is called litral.

```
int num = 100;
          → litral
```

100 → Integer litral
10.1f → float litral.
10.1 → double litral
'A' → character litral
true → boolean litral
"Anand" → string litral

⊙ Keywords

- Keywords are the words which are used and reserved by Java compiler. They can't be used as identifier.

! True, false and null looks like keywords but actually they are litrals. However they can't be used as identifier in a program.

⊙ Reading data from the keyboard.

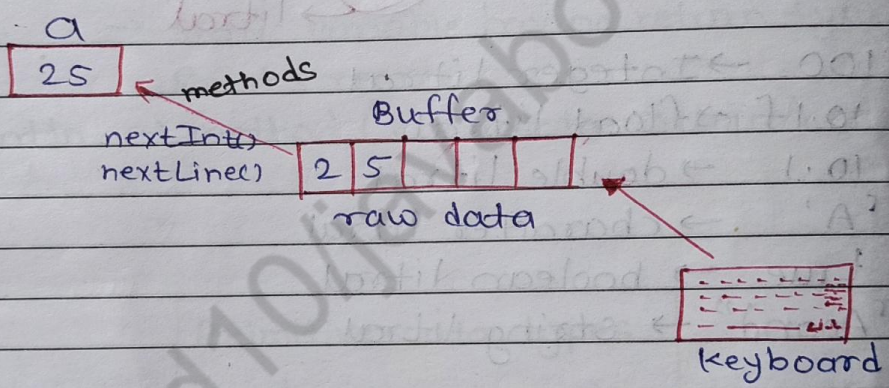
- In order to do this we have scanner class. But we need to import it first to our Java file.

```
import java.util.Scanner;
```
→ path of scanner class

- Scanner class have lots of methods which we can use like ~~int Next~~ nextInt();

Syntax:

```
Scanner sc = new Scanner(System.in);
int a = s.nextInt();
```
↑ scanner object
↑ method to read int



- These methods are stored in scanner class.
- So we first create object for scanner class
- Then we call method after calling it converts raw data into specific data like int and then it get stored.

- Some useful methods

* method used to read string

```
.next();    // reads only first word
.nextLine(); // reads whole line
```

* method used to read char

```
.next().charAt(0);
```
↑ This will read first word.
↑ This will only take first one letter from input.

* Taking input of numbers like binary, hexadecimal octal

  • nextInt(base);

- Base means binary numbers have base 2 octal have 8, hexadecimal have 16 like that.
- for octal input •nextInt(8);