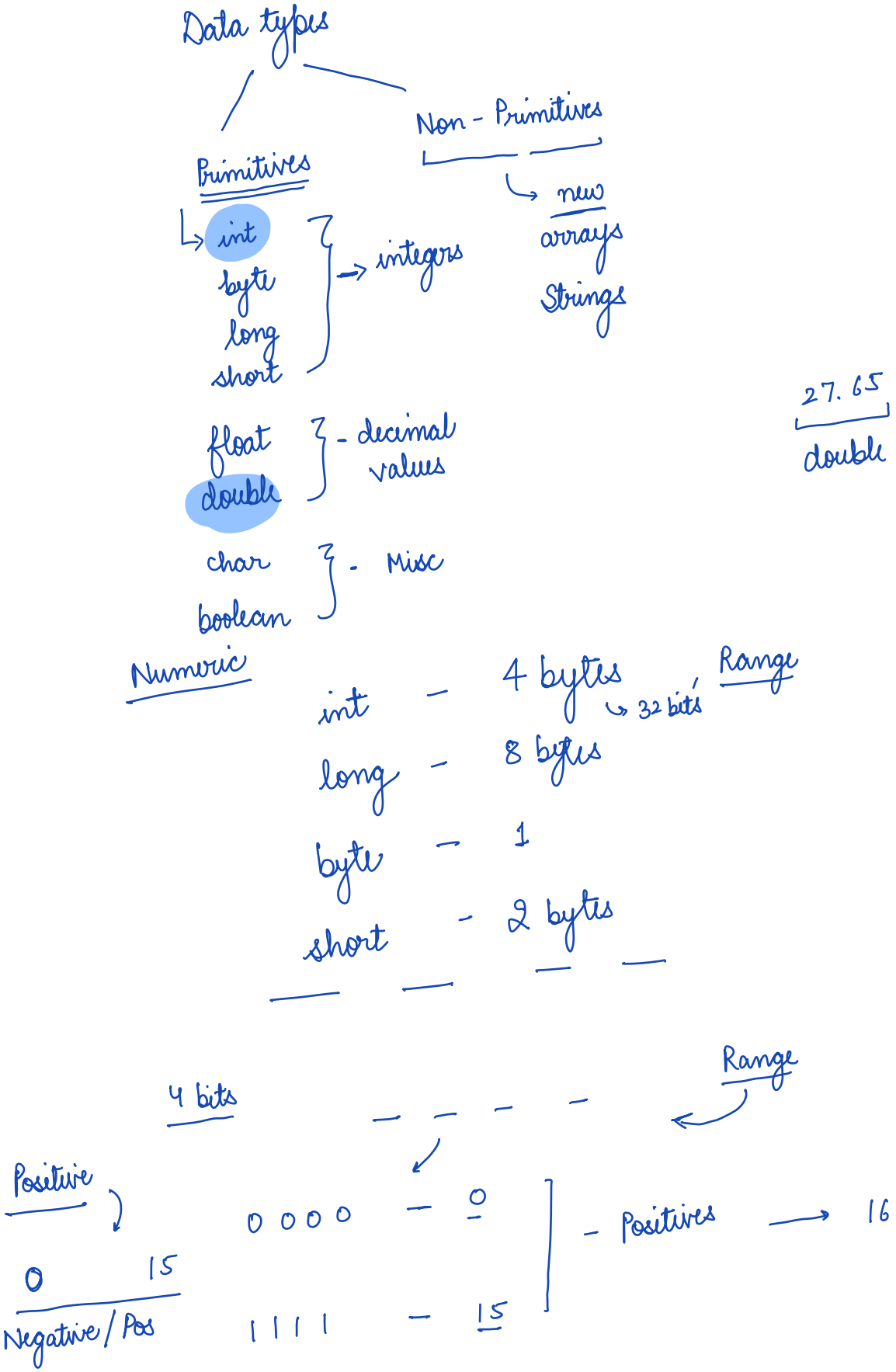
Today's content

- Datatypes and Ranges
  - Circularity
  - Promotion and demotion of data types

- Non-primitive data types
  - Classes and Objects => OOPS basics
  - Arrays - Pass by value
  - String

- Wrapper classes
  - Function calling with non primitives
  - Immutability


Data types
Primitives
Non - Primitives
new
int
byte
long
short
integers
arrays
Strings
float
double
decimal values
27.65
double
char
boolean
Misc
Numeric
int - 4 bytes
32 bits
Range
long - 8 bytes
byte - 1
short - 2 bytes
4 bits
Range
Positive
0 15
Negative / Pos
0000 - 0
1111 - 15
Positives
16 rep

-8 -1 | 0 - 7

8 | 8

int a = -10

0000
0001
0010
⋮
1111

16 rep — 8 rep - neg
8 rep - pos.

4 bits - 16 rep

-8 -1 | 0 — 7

-ve | +ve

7

-8

-ve numbers → 2's complement

4 bits
-8 to 7

5 bits
-16 to 15
-2^4 to $2^4 - 1$

6 bits
-32 to 31
-2^5 to $2^5 - 1$

8 bits = 1 byte = byte
-128 to 127

-2^7 to $2^7 - 1$

n bits :

-2^{n-1} to $2^{n-1} - 1$

Ranges

byte : -128 to 127

16 bits short : -2^{15} to $2^{15} - 1$

32 bits int : -2^{31} to $2^{31} - 1$

64 bits long : -2^{63} to $2^{63} - 1$

$\Rightarrow$ 1000.15.467 → 10 digits

int

-2^{31} to $2^{31} - 1$

$2^{10} \approx 1024 \approx 10^3$

$-2^{10} \times 2^{10} \times 2^{10} \times 2^1$ to $2^{31} - 1$

$-10^3 \times 10^3 \times 10^3 \times 2^1$ to $2^{31} - 1$

-2×10^9 to $2 \times 10^9 - 1$ → $\approx 10^9$

- 1000015467 = 10 digits

To Do ← long

Range

byte

↳ 8 bits

-128 to 127 - 256

⇒ 0 to 255 - 256 ✗

✳ 1. by default → signed data types.

2. there is no unsigned.

- 2 weeks - Questions - Concept:

Pre - B - Java

byte

-128 127

127 + 1

byte b = 127

8 bits

b = b + 1 → constant

b — byte — int

byte — Print — b → 32 bit

large co

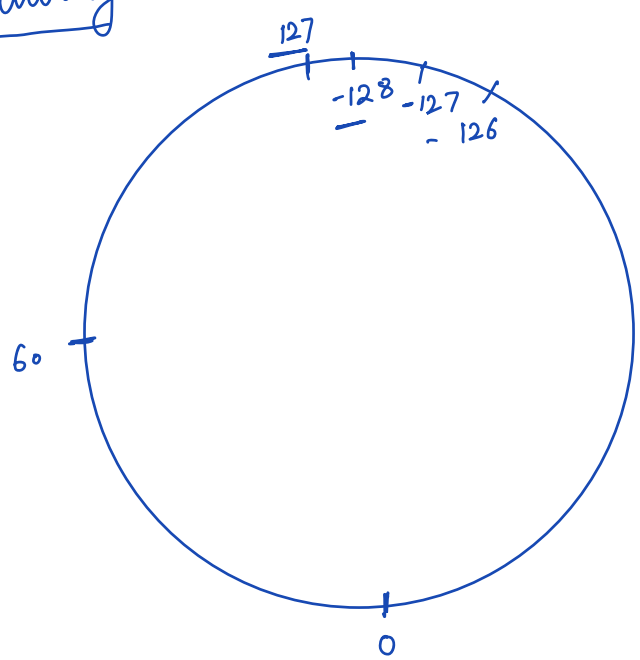
smaller ↓

forcefully

-128 — b + 1

circularity

b



127 + 1

i = 257

9 bits

= 1 0 0 0 0 0 0 0 1

256 128 64 32 16 8 4 2 1

byte - 1 byte / 8 bits

0 0 0 0 0 0 0 1 → 1

b = 127 → 0 1 1 1 1 1 1 1

1

b = b+1 → -128 +

1 0 0 0 0 0 0 0

-128 2's com

b = b + 127

4B ← float | - decimal

8B - double

64 bits

3.142 = 3142 × 10^{-3}

M E

3.142 = 3142 × 10^{-3}

3 M

char → 2 bytes ✓ ← Unicode

ASCII → 1 byte ✓
256

boolean

char
↳ 256 ASCII chart

ASCII mapping

char ch = 'A'

'A' → 65

binary

boolean = 1 byte

1B

T - 1
F - 0

True
False

sizeof ( )

ASCII

256

UNICODE

2^{16}

Non primitives

↳ Basics of OOP

Classes

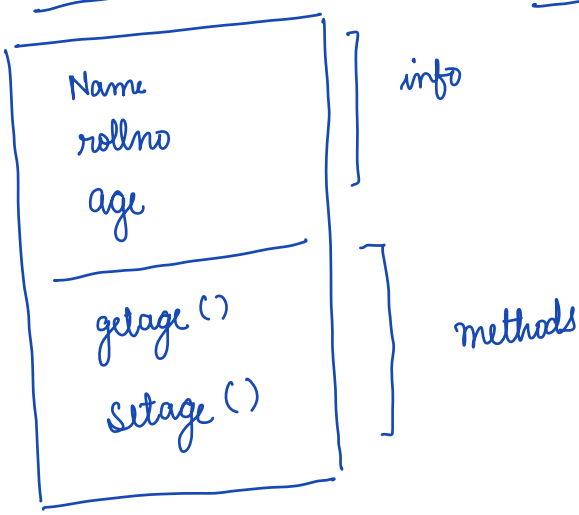
Object

Class - user defined data type

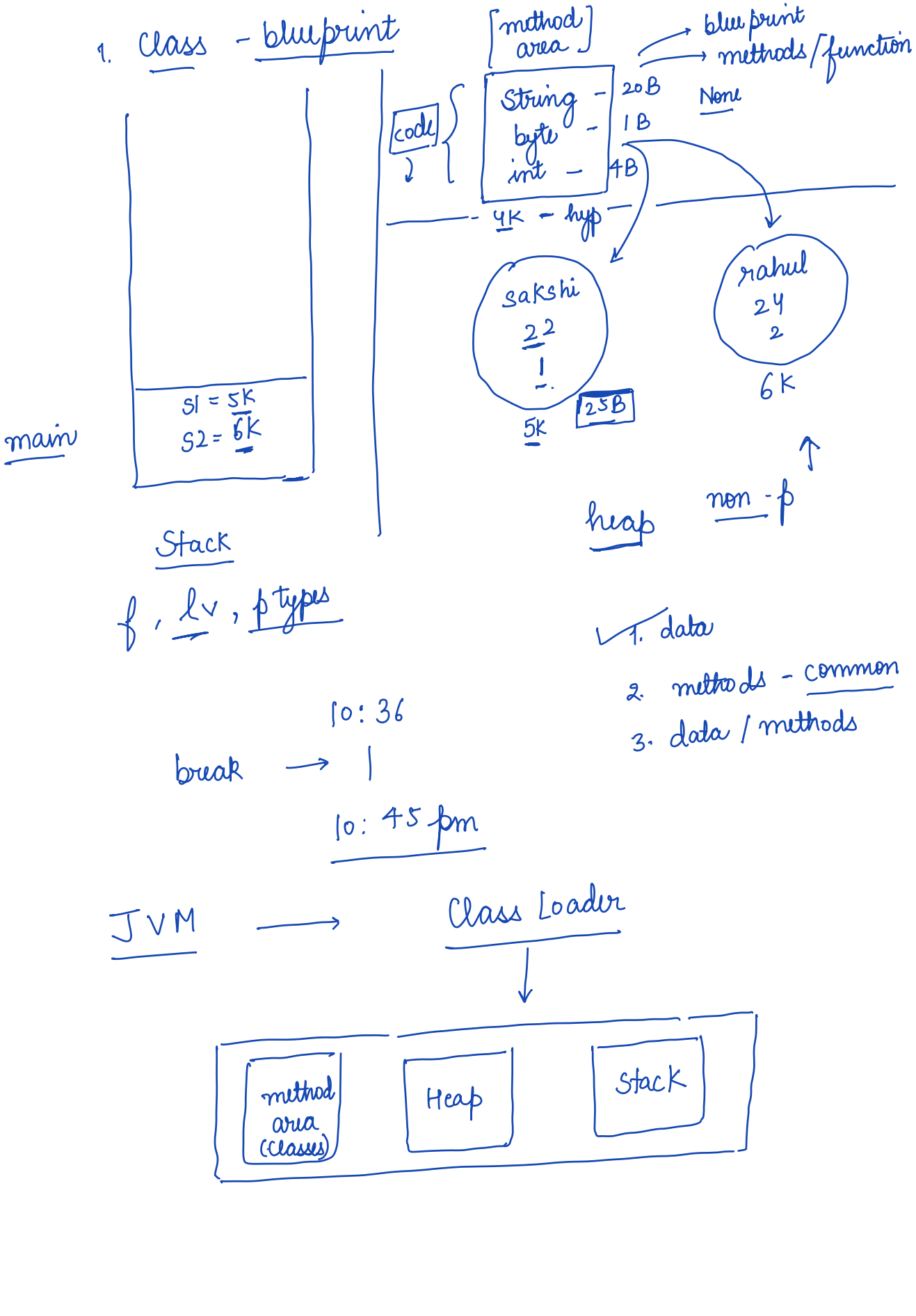
- blueprint

Student

- data / info / attributes
- methods / functions / bih.



1. Class - blueprint



f, lv, p types

1. data
2. methods - common
3. data / methods

10:36

break → 1

10:45 pm

JVM → Class Loader

Class

private
public
default
protected

data.

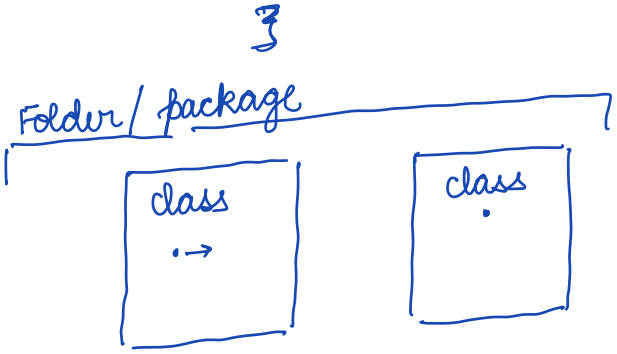
methods

class { }

private
↳ local

public - anywhere
↳ global

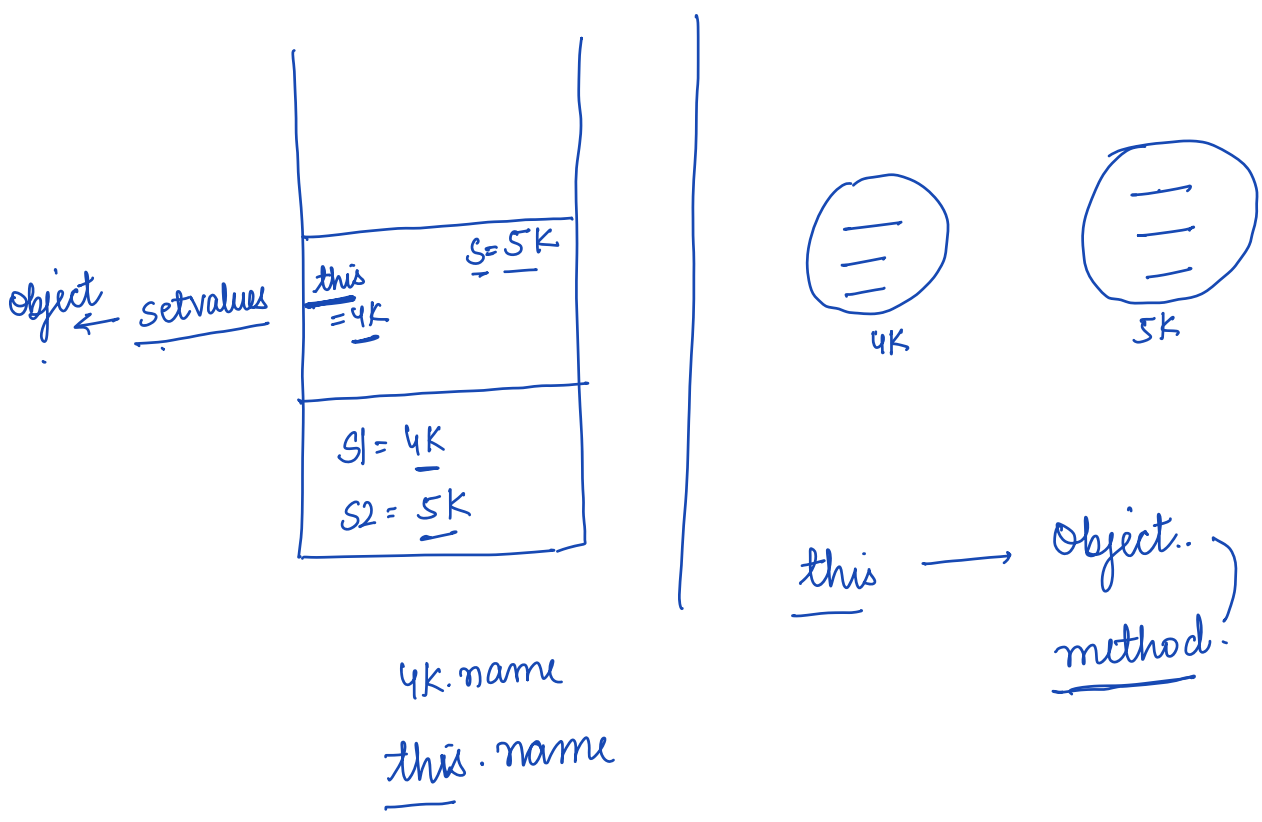
default
↳ same folder



- Constructor
  - ↳ creates object — default
    - ↳ 1. allocate space - default, parametrised
    - ↳ 2. initializes value

name : null
age : 0
int : 0

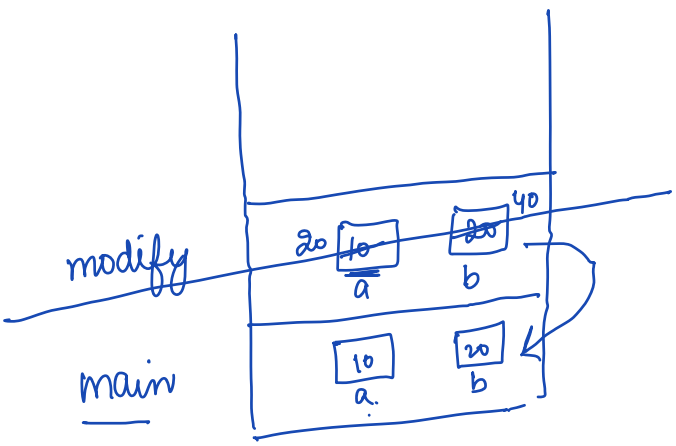
S → name, age, rollno → name, age, rollno



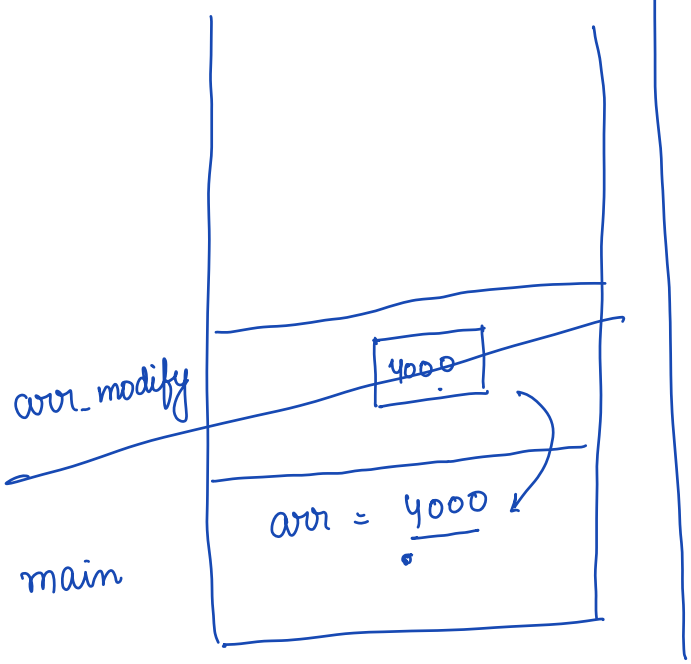
Non primitives — function.

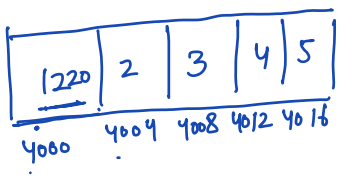
Arrays — new
Heap

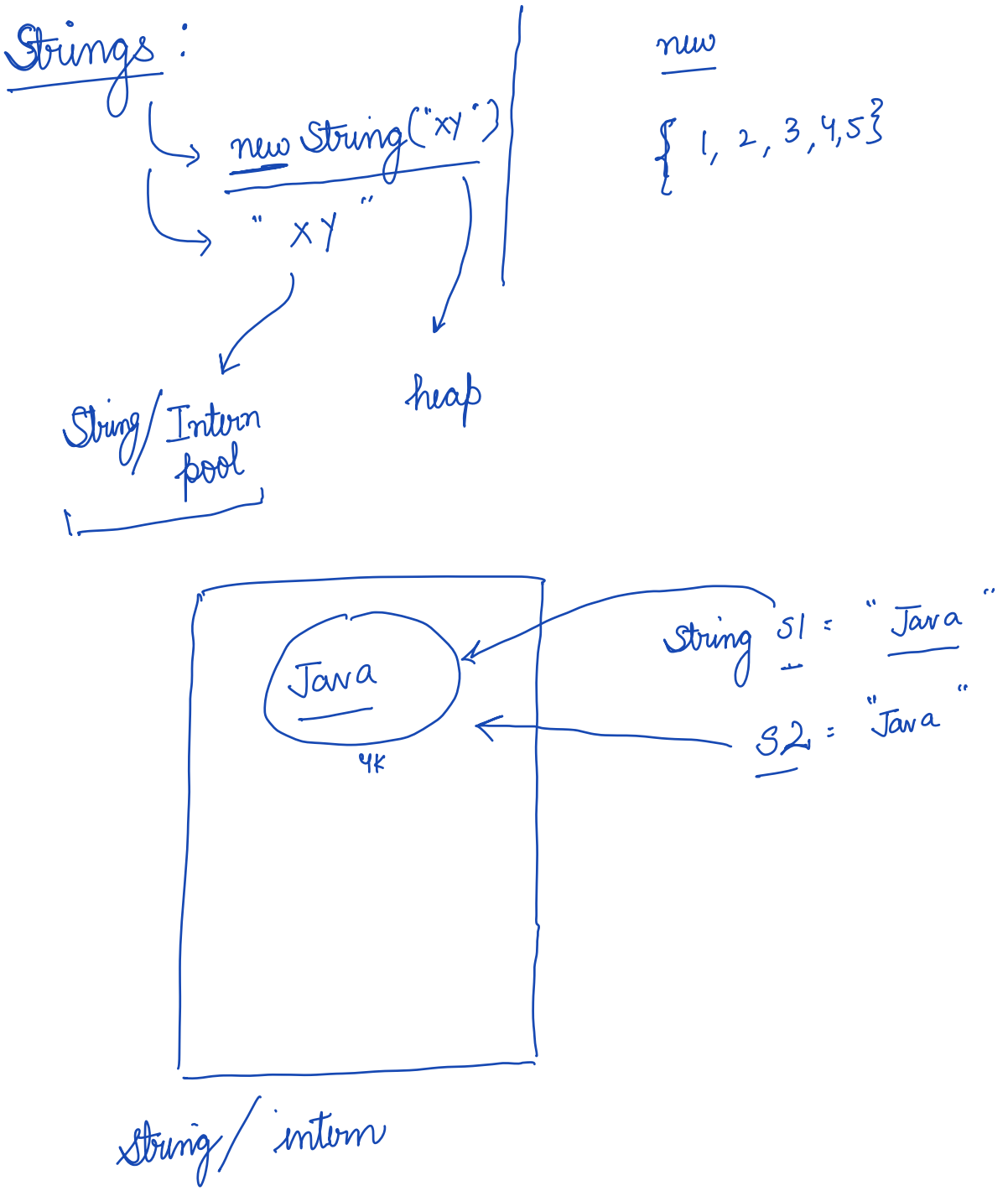
Pass by value

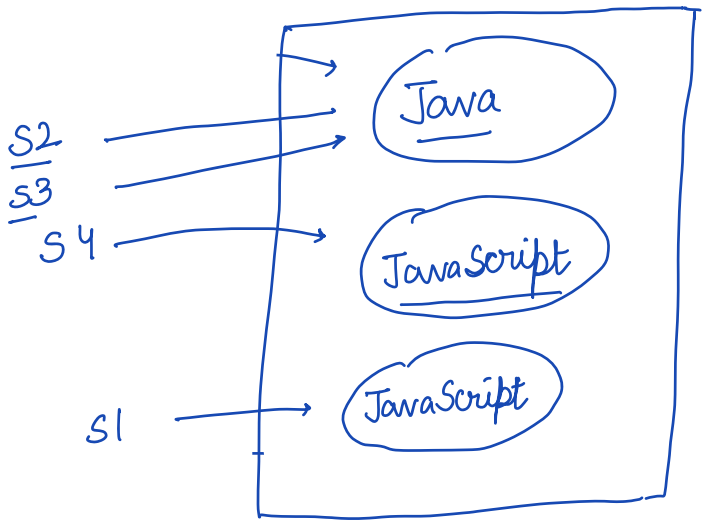


Pass by value






Strings :
new String("xy")
"xy"
String Intern pool
heap
new
{1, 2, 3, 4, 5}
Java
4K
String s1 = "Java"
s2 = "Java"
String intern



Strings → immutable

S1 = "Java"

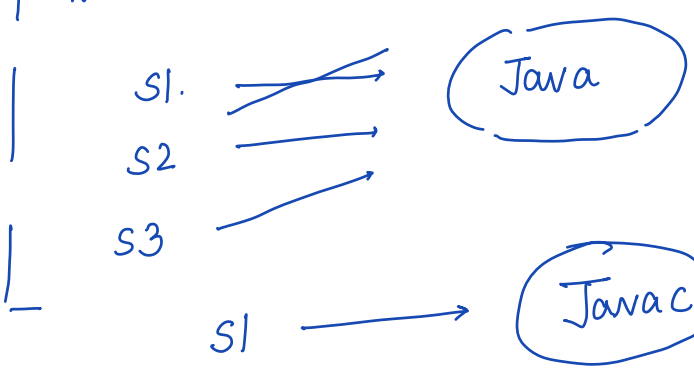
JavaScript

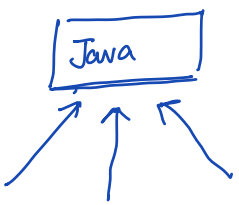
JavaScripts.

— No

Why?

1. intern → save space





2. thread safe

a = a+1

L
Inc
Store

T1	T2	T3
-	-	-
F1	F2	F3

To Do :

[StringBuffer
  StringBuilder] - API

Doubts :