STRUCTURAL DESIGN PATTERNS

- → Flyweight
- → Facade

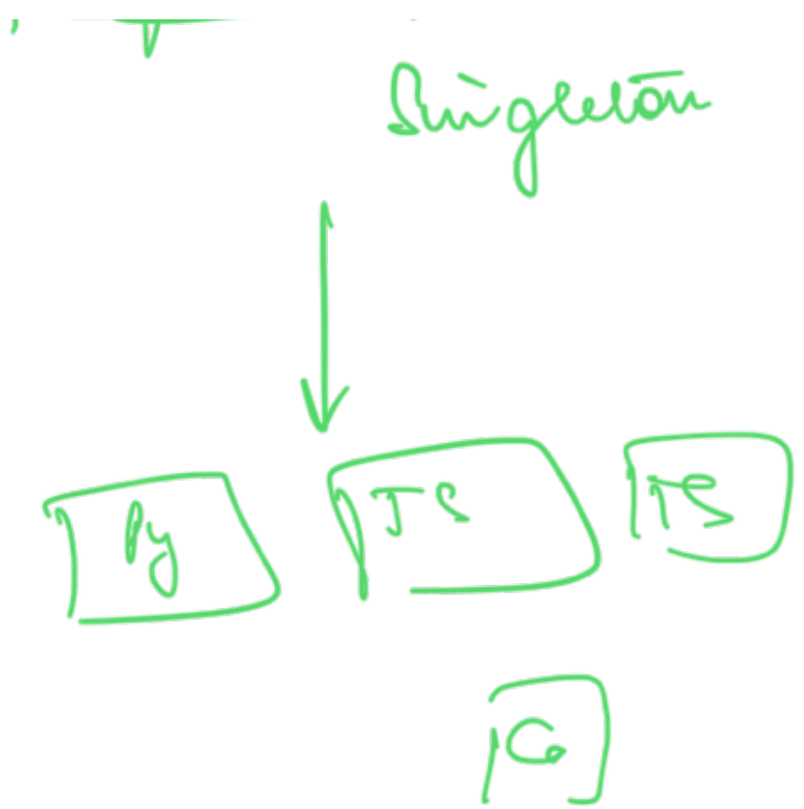
Support @ Scaler.com

// (Start at 9:10 PM)

How to approach LLD problems

- → Theoretic
- → Case Studies
  - BMS
  - _Xyz

refactoring.guru



60 people

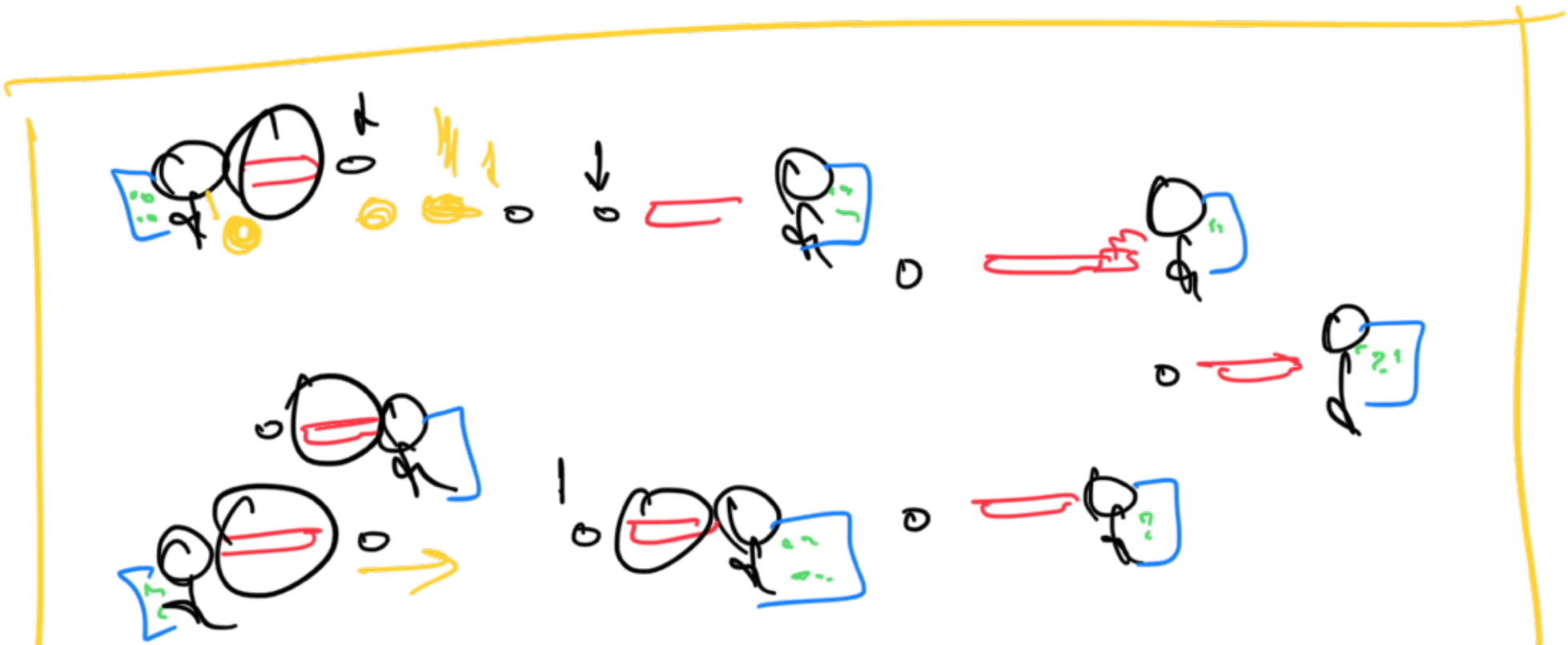
120 people

Structural Design Patterns

① Flyweight

② Facade

Flyweight DP



SWE @ PUBG

Frontend of PubG

Player

Ground

Gun

- Bullets

Bullet

TypeScript

JS

Bullet

radius : double 8
weight : double 8
X-coord : double 8
Y-coord : double 8
Z-coord : double 8
direction : double 24
Speed : double 8
Status : int 4
color
image : byte [] 4

5.56 w
9 M
7.62 mm

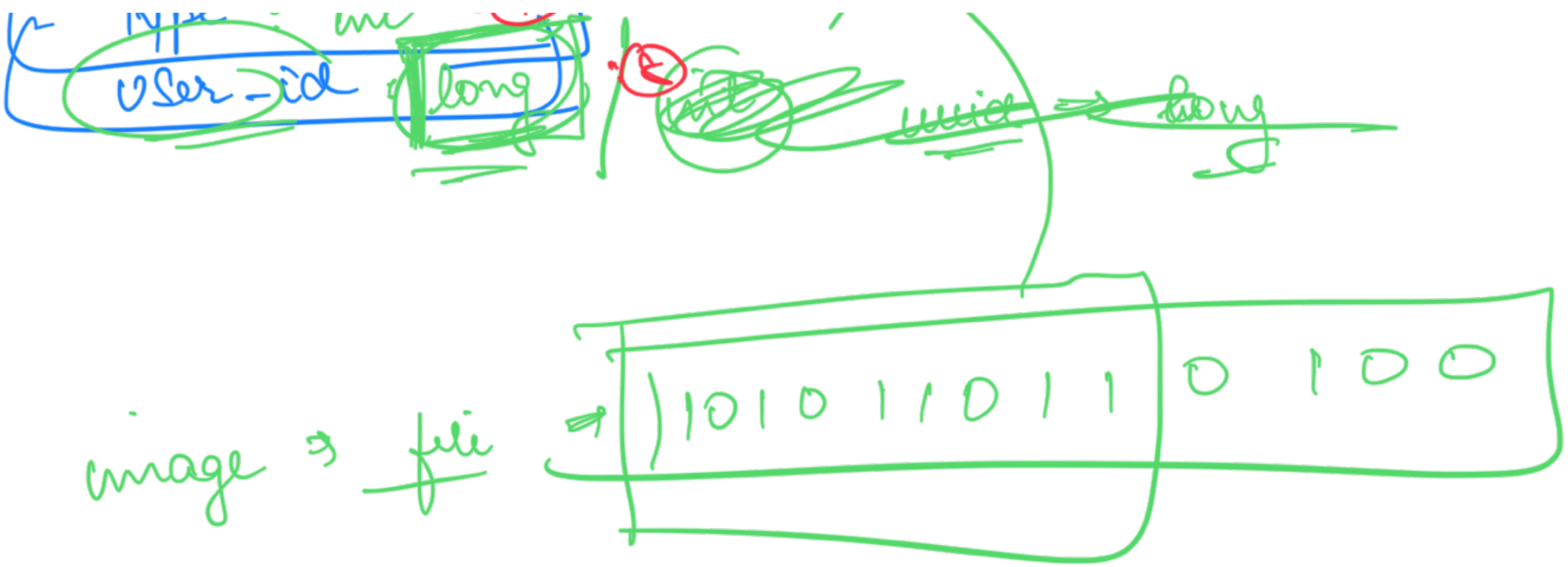
(lat , long)

1 Bullet Obj

88 Byte + 1kB

~ 1kB

1kB



When we play PubG

⇒ 400 Bullets / person

⇒ 100 people / game

≈ 2000 Bullets / game

1 KB * 40 * 1000

1 MB * 40 ⇒ 40 MB

1 KB * 2000 * 100

2 MB * 100 = 200 MB

20 diff type of bullet

The number of attributes of obj is Enough

Unique Bullet

radius

weight

(x, y, z) coord

100 Bullets ⇒ 5.56 mm

(1) Intrinsic : property of the bullet

2000, 100

⇒ new flying Bullet

⇒ new chang

② Extrinsic

⇓

external environment

⇓

value of these attrs keep

on changing

Bullet

Intrinsic

Bullet

radius → 8B

weight → 8B

image → 16B

type → 4B

extrinsic

Flying Bullet

(x, y, z) Coord → 24B

(x, y, z) Angle → 24B

Speed → 8B

Status → 4B

UserId → 8B

Bullet → 8B

T6B

~ 1KB

Playing Bullet

fb · getBullet() · getImage()

String

5.56

B1 B2 B3 B4 B5

5.56u

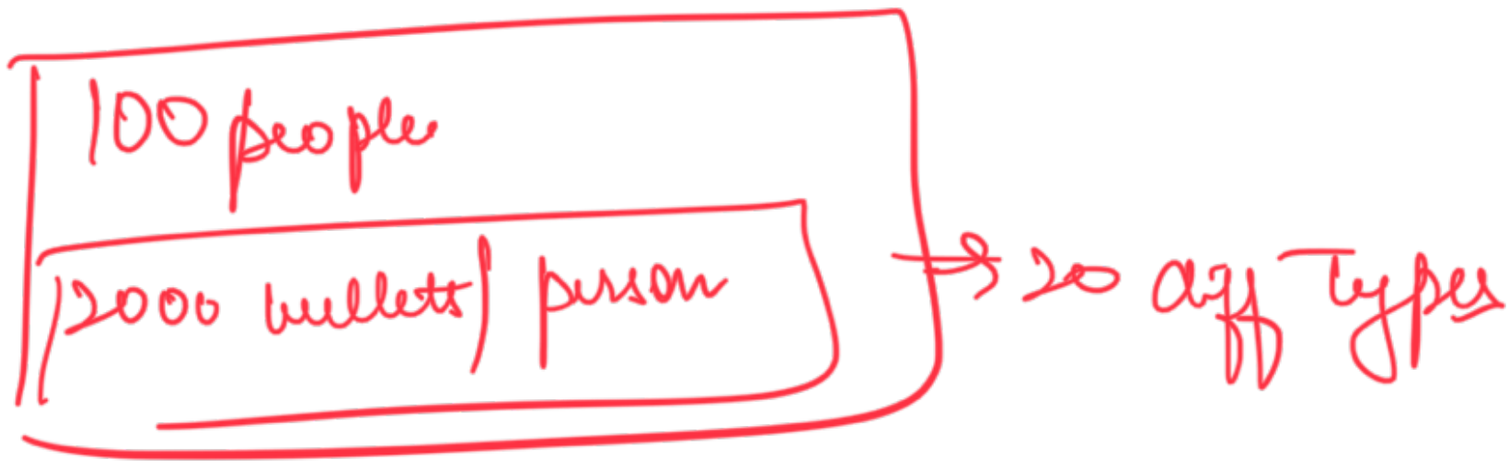
10

Bullet
5.56

FB1

FB2

Scenarios



w/o flyweight

1KB * 100 * 2000 → 2MB * 100 = 200MB

with flyweight

#of Bullet obj = 20

Size / Bullet = 1KB

⇒ Total = 20KB

Flying Bullets = 2000 * 100

Size / FB = 76 Byte

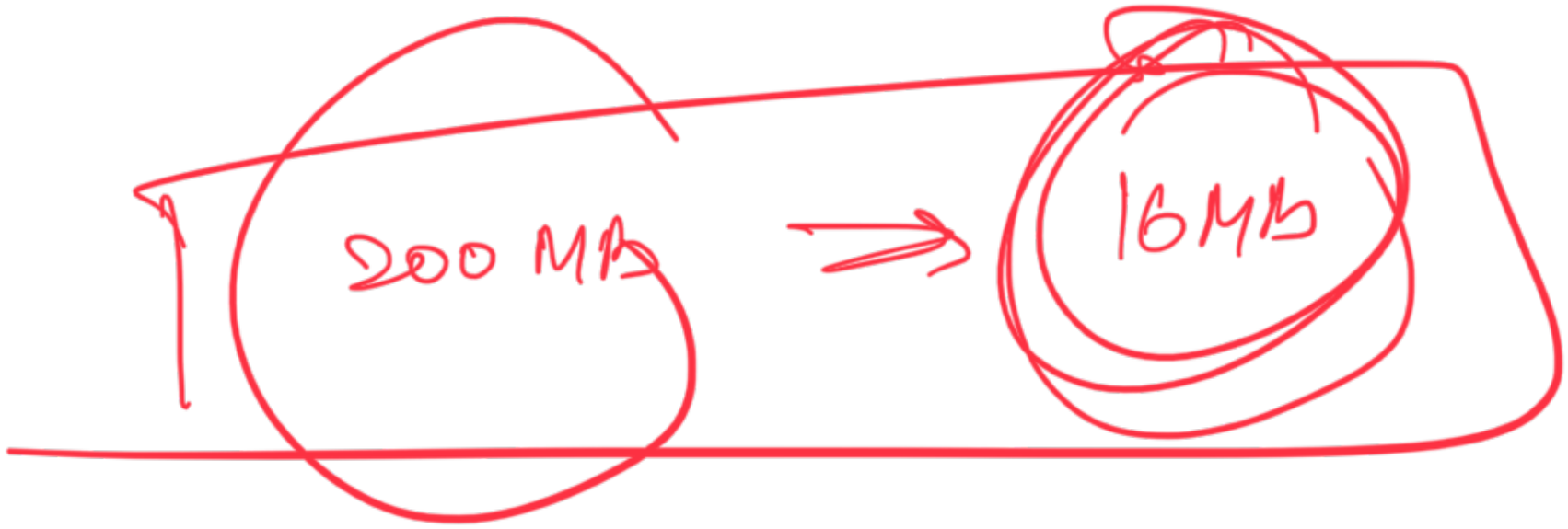
⇒ Total = 76 * 2000 ^ 100 By

⇒ 76 * 2 ^ 100 KB

⇒ 15200 KB = 15.2MB

(+)

Total = 15.22 MB ≈ 16MB



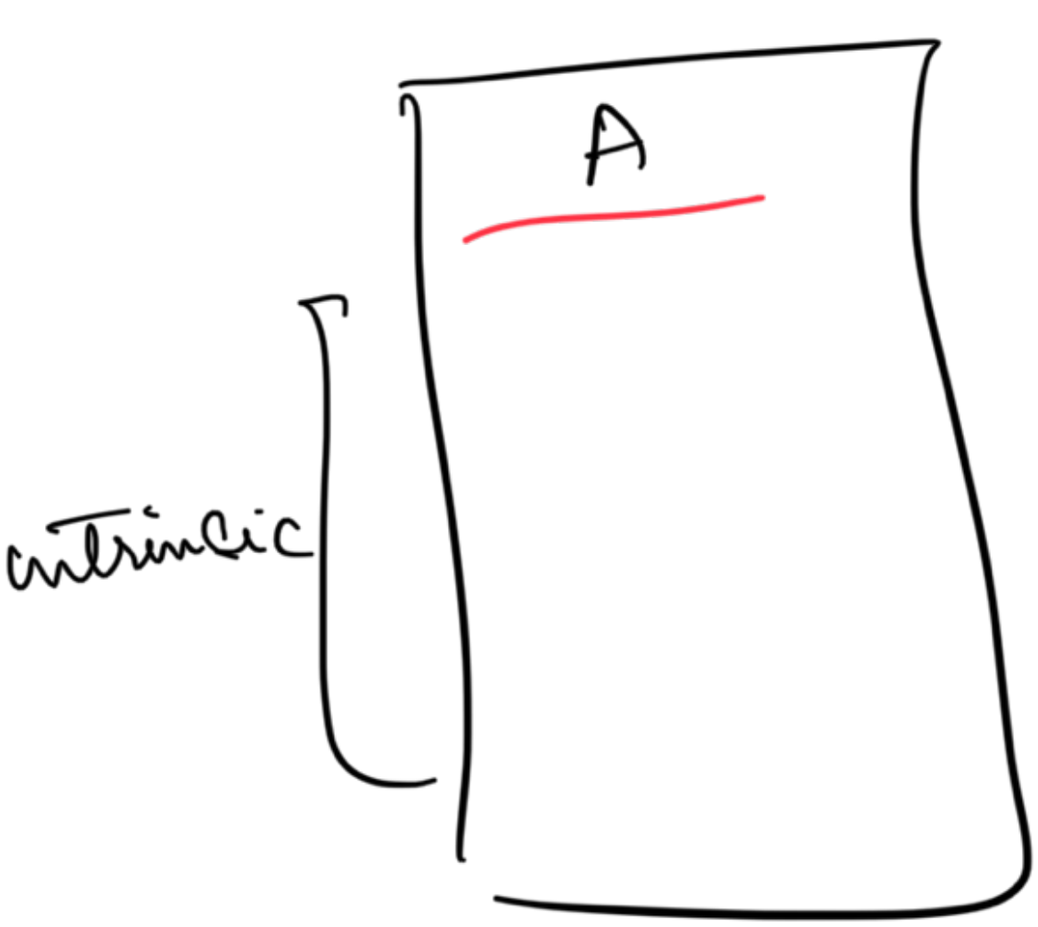
Flyweight

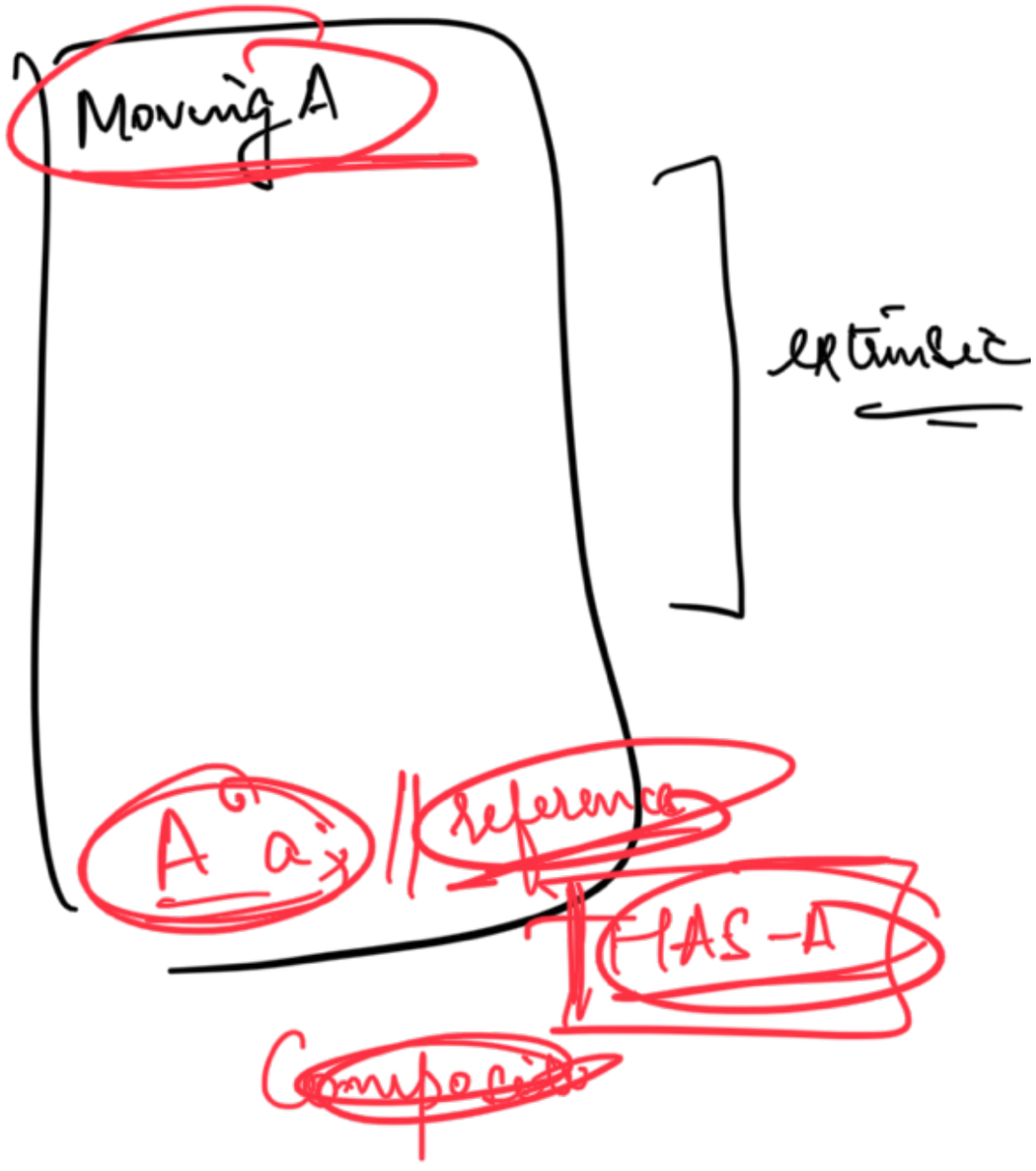
when a class has 2 types of attrs

- intrinsic
- extrinsic

And it leads to excessive memory usage

How to use FDP



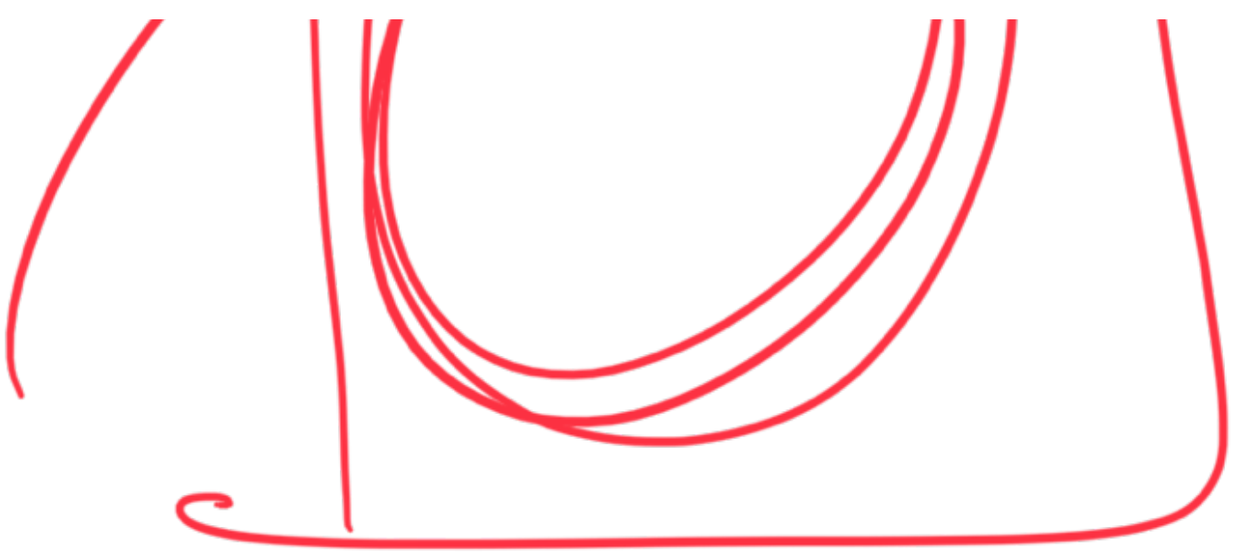


Size of address in your ARM

64 Bit ⇒ 8by

fb. getBullet(). getWeight()

Move




weight


Submission

Question

Facade Design Pattern

Complex Scenarios / Confusing Situation

Interfaces

Flipkart {

Payment Gateway pg;

Inventory Mgmt System ims;

Place Order () {

pg. check Payment ();

inventory mgmt sys. update Stock ();

email Service. Send Email ( );

analytics System. manage Order ( );

notify Mgmt.

}

addToCart()

checkout()

search()

Flipkart {

PaymentHelper paymentHelper;

= makePayment() {

=> paymentHelper.makePayment(this);

}

addCart()

}

update Address()

Facade Class

helpers /

PaymentProcessor {

Payment Gateway pg ;

Inventory Mgmt System ims ;

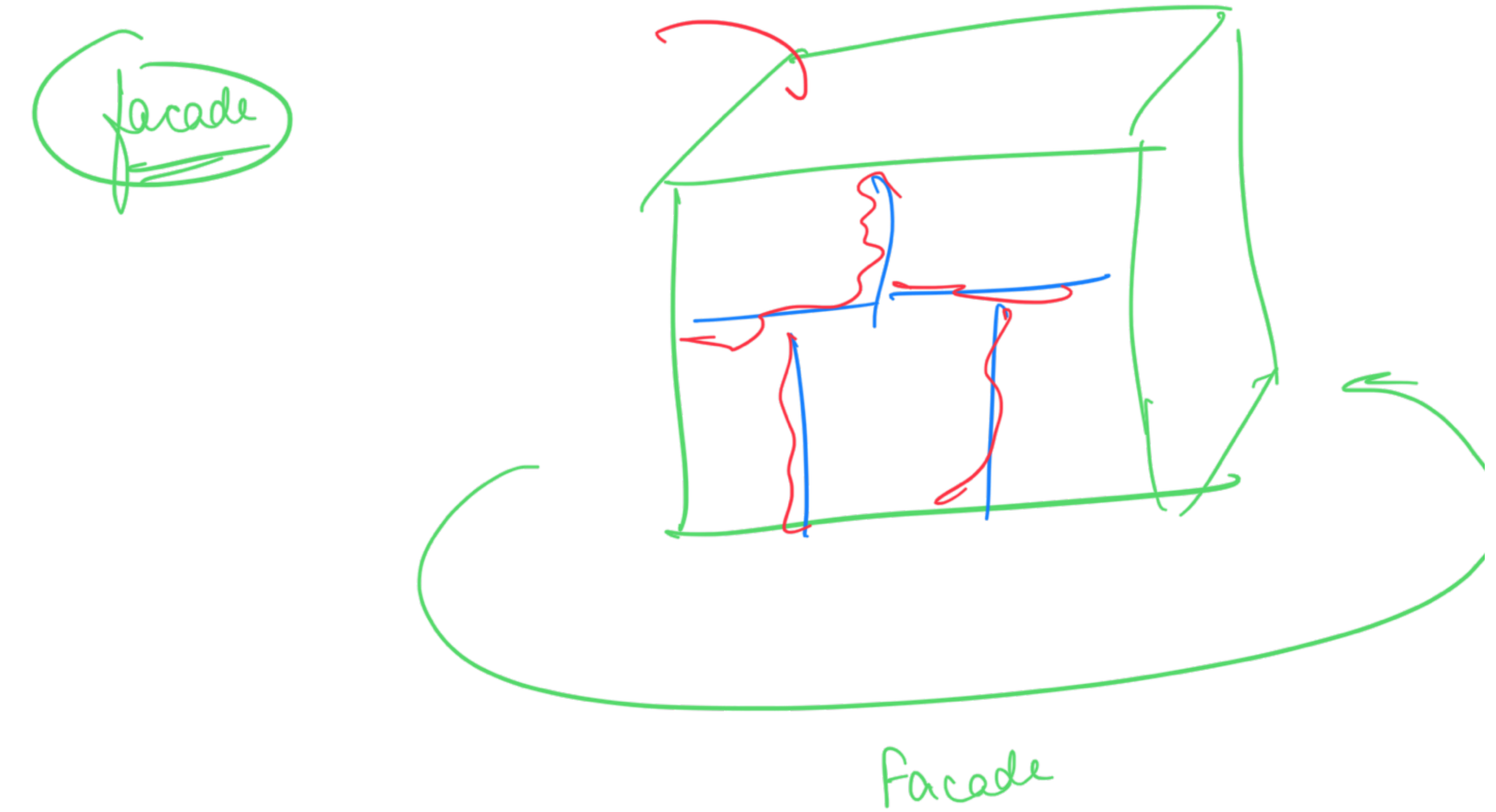
Email Service - email service

makePayment() {

}

y

facade



(1) I have a class which to do one operation needs to work with a lot of dependencies

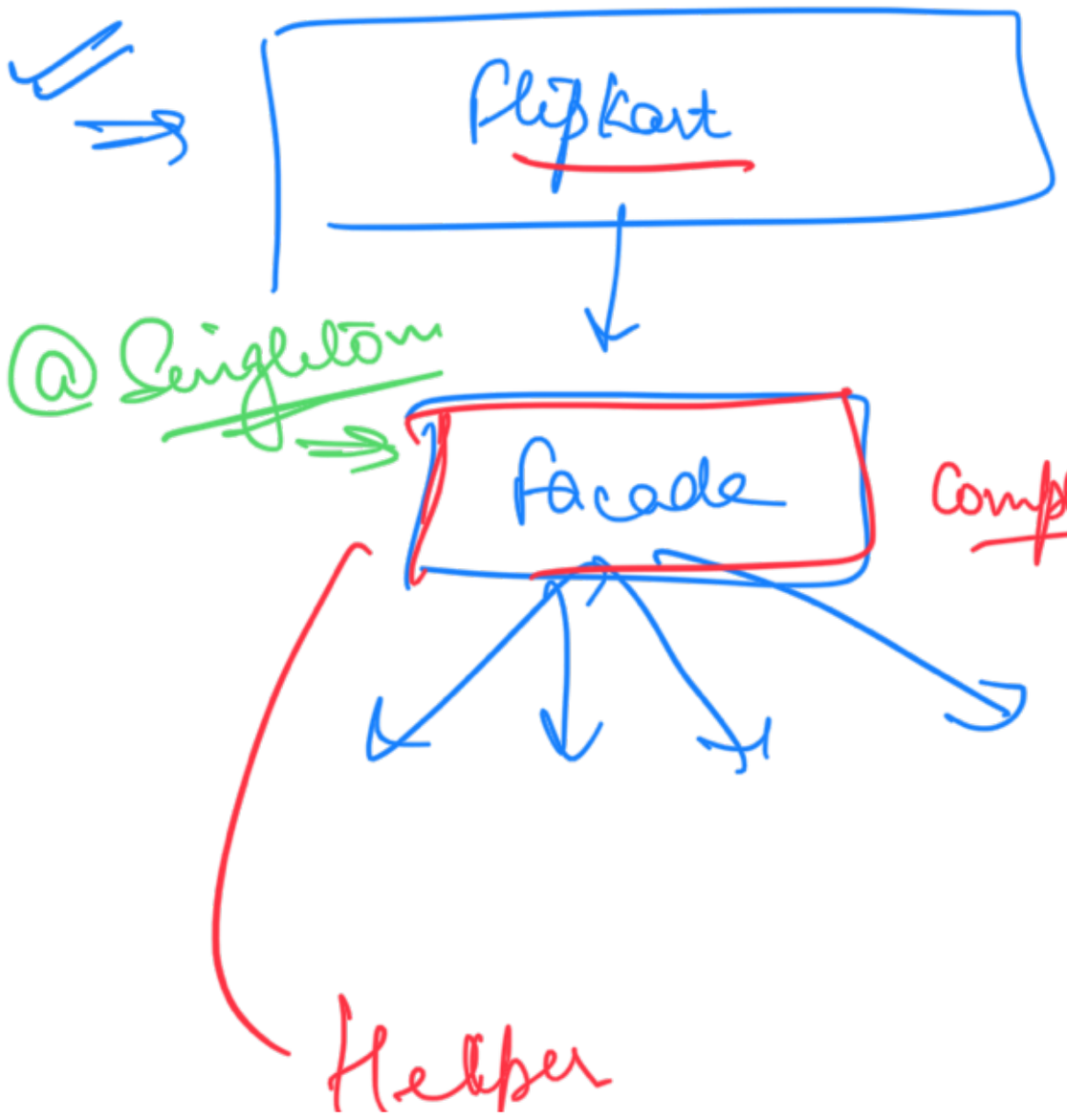
→ SRP ✗

→ O/C (Any thing in the logic changes → open that class)

(2) Extract out the logic of working with diff dependencies for that method into a separate

Class

→ facade Class



Aggregator
Simplifier

Web Server

SearchUser( ) {

Socket S = new Socket

S. bind ( )

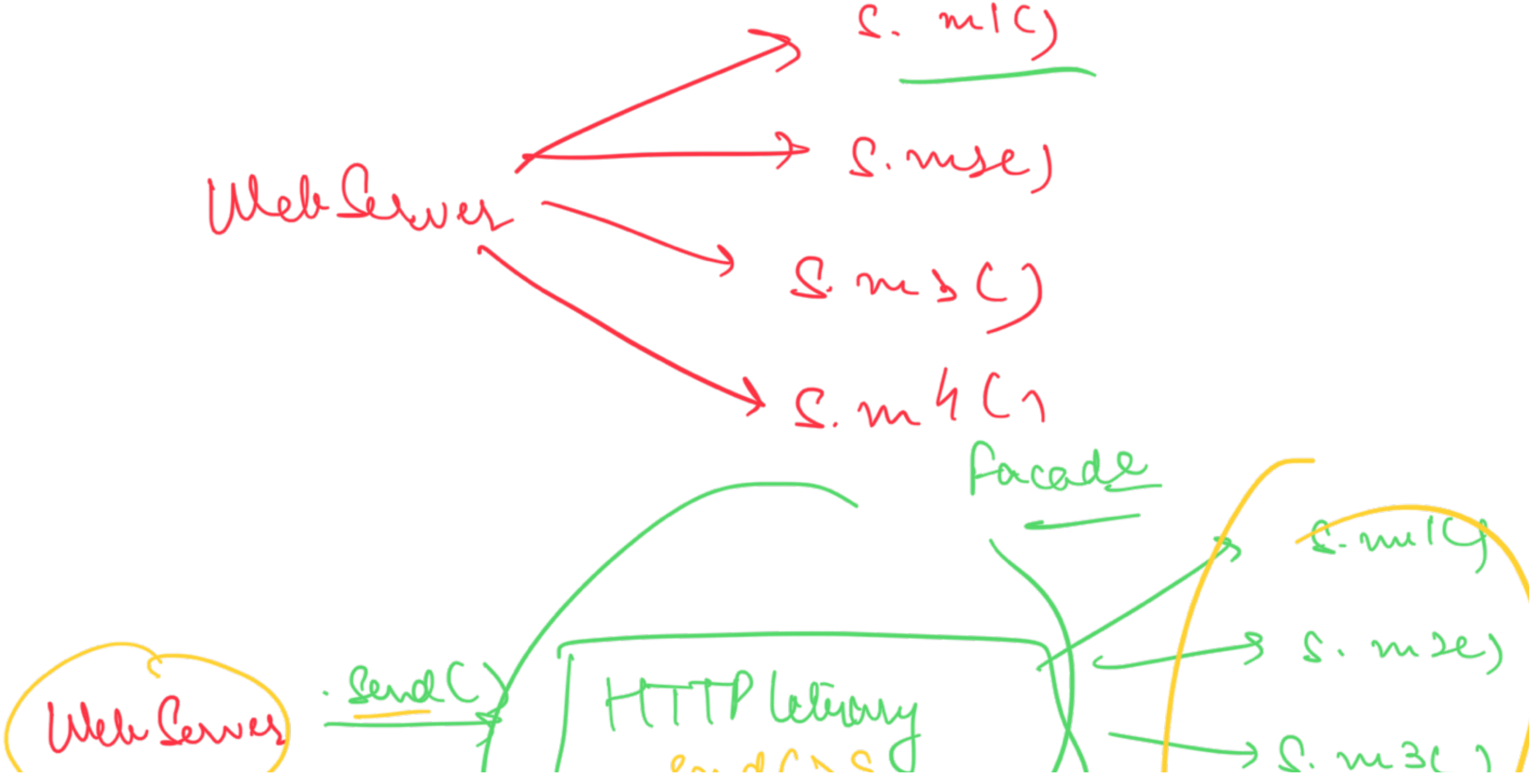
S. connect( )

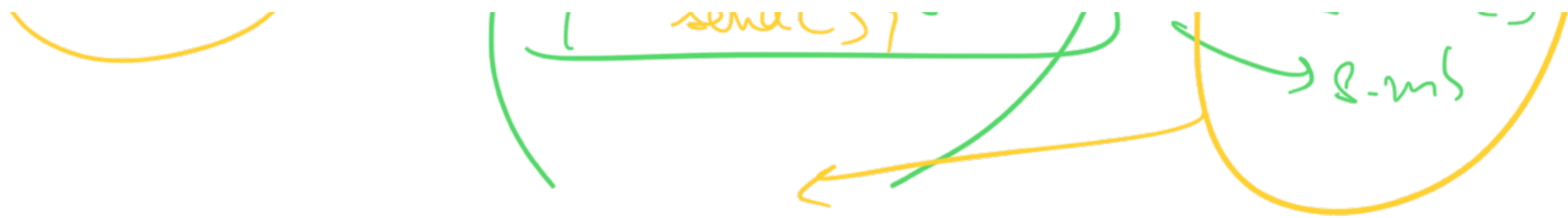
while(data != null

S. send (data

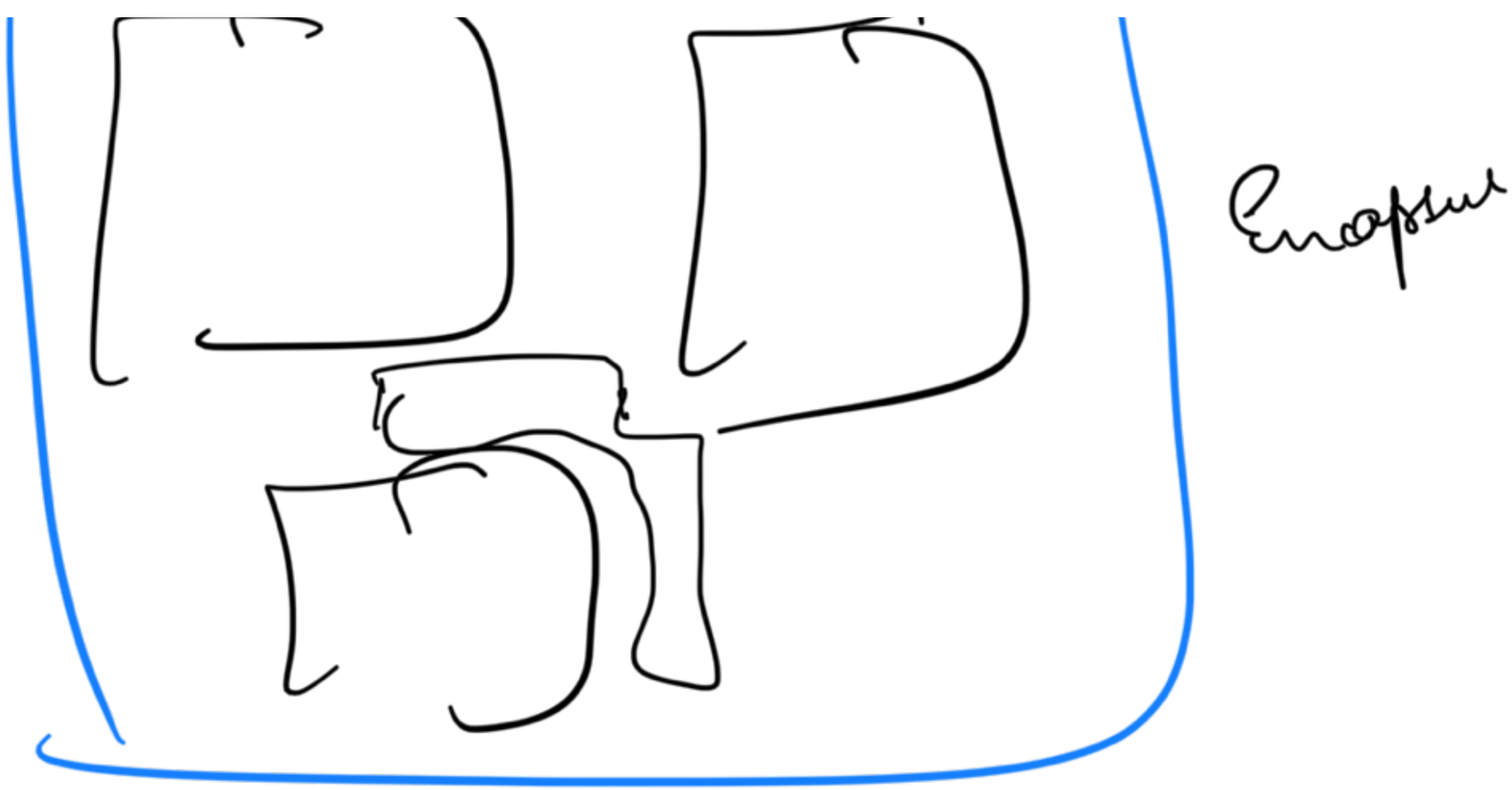
}

S. send (


s.m1()
s.m2()
s.m3()
s.m4()
WebServer
facade
s.m1()
s.m2()
s.m3()
.send()
WebServer
HTTP library



Facade prevent the client from calling multiple methods in a sequence and it should it calls a single method of a facade



Emprise

Ingénieur

Façade

Refactoring. guru

7 Structural

⇒ 4

⇒ Read other's from refactoring

— I need help in C++ "

Rani a HR if you dont

any

Adapter v/s facade

wraps single 3rd party class

wrapper for multiple - internal + external classes

Decorator : Structural

I have a class where I can add properties to it at runtime in any order.

Singleton ⇒ One obj

Builder ⇒ Build

Factory ⇒ ——

Prototype ⇒ Clone()

Decorator ⇒

Facade ⇒