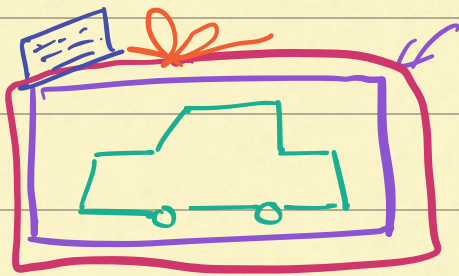


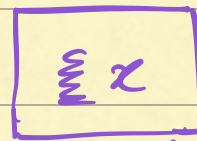
Agenda :

- Decorator
- Flyweight

Decorator : wrapper



Toy/Car
/Gift



+ add some things



Starbuzz → coffee shop

<< Beverages >>

Abstract / Interface
getCost();
getDescription();

House blend

decaf

Robusta

Espresso

Addons : → getCost
get Description

- milk

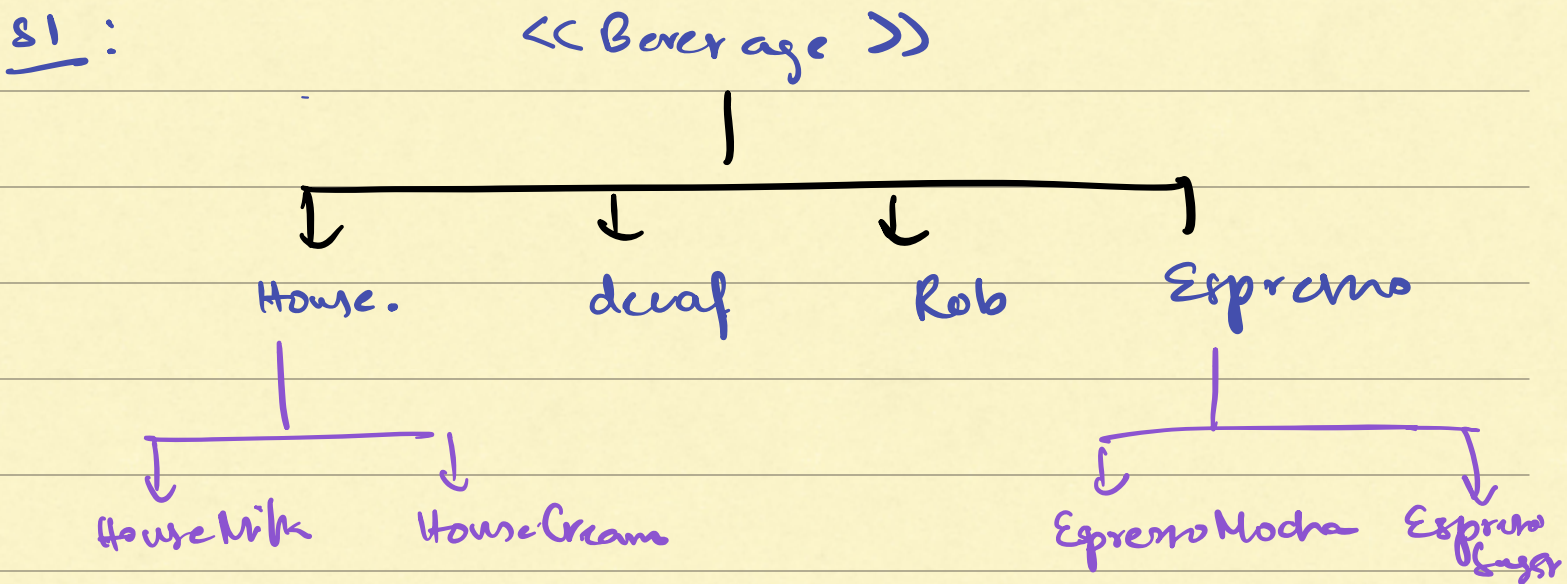
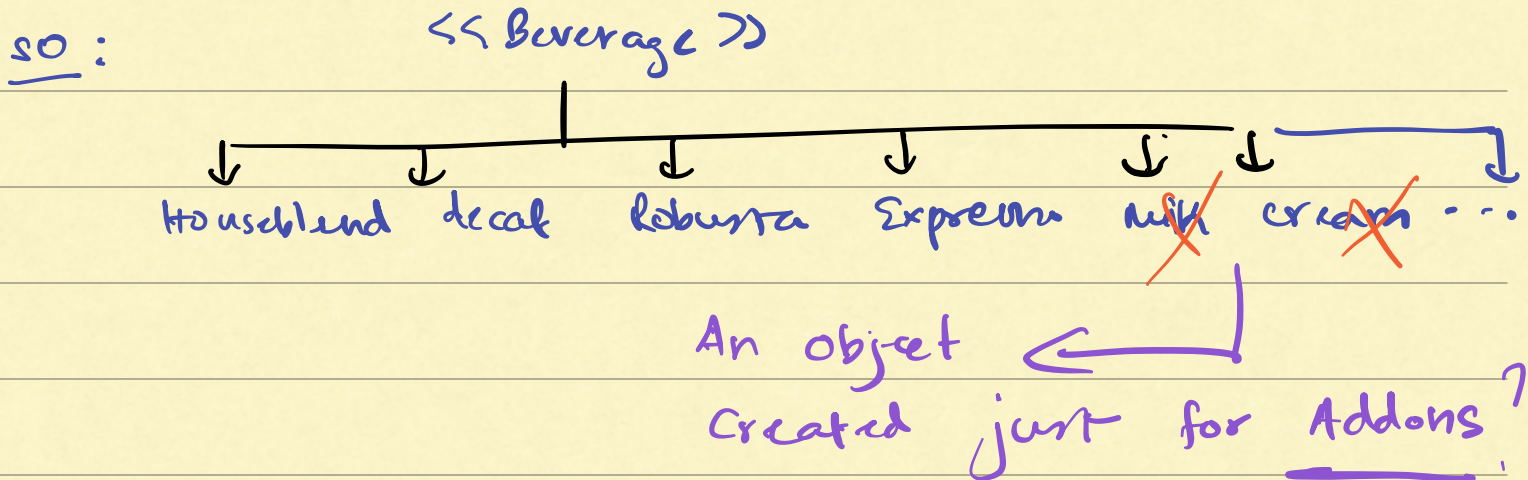
- whipped cream

- mocha

- sugar

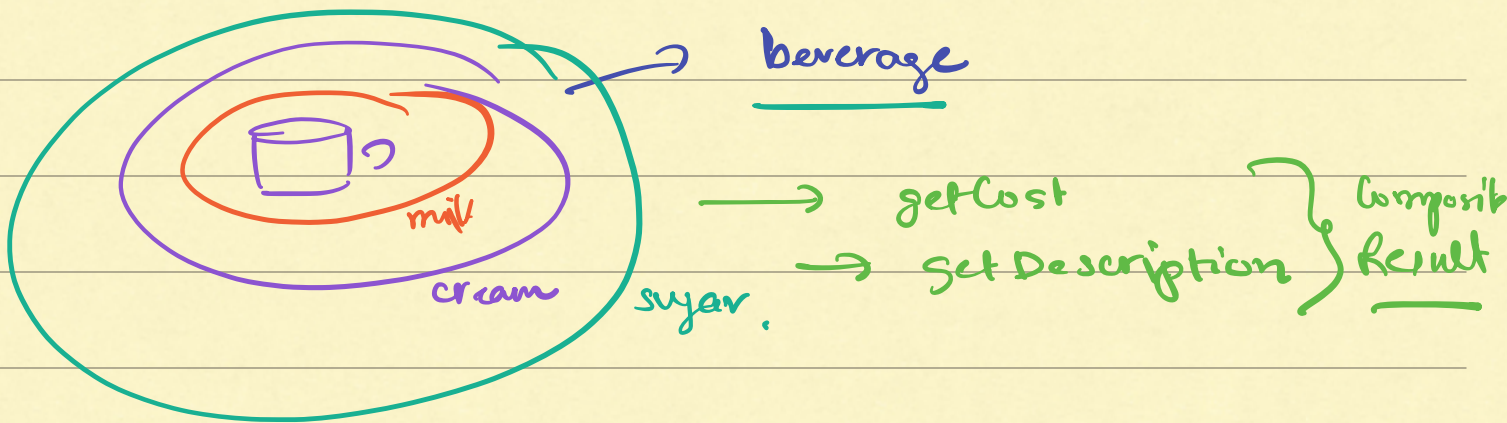
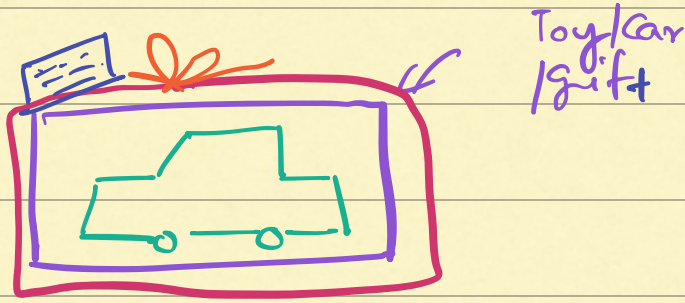
- heavy Cream
- chocolate Sauce

Solution for Beverage + Addon :



Class Explosion

s2 : Final Solution !



1. After adding everything Final Object should be of type Beverage
2. Functions like getCost and getDescription should have all the costs & desers of beverage and addons.

<< Beverage >> Extend → << Addon >>

- getCost();
 - getDescription()

- getCost();
 - getDescription()

```

    1
    ↓   ↓   ↓   ↓
    HB  D   R   Esp
  
```

```

    getCost() {
      =
    }
    getDescription() {
      =
    }
  
```

```

    Milk  Cream  Sugar
  
```

```

    getCost() {
      return b.getCost() + 10;
    }
    Beverage b;
    public Milk(Beverage b) {
      this.b = b;
    }
  
```

Beverage b = new Milk(new Houseblend());

Real World Examples of Decorator r.

1) HTML Elements → Button → { border, image, margin } Button

2) notification → { sms, mail }

App → send()

Notification n = new SmsSender(new Notification n, Notification());

send();

// send an SMS

n.send();

}

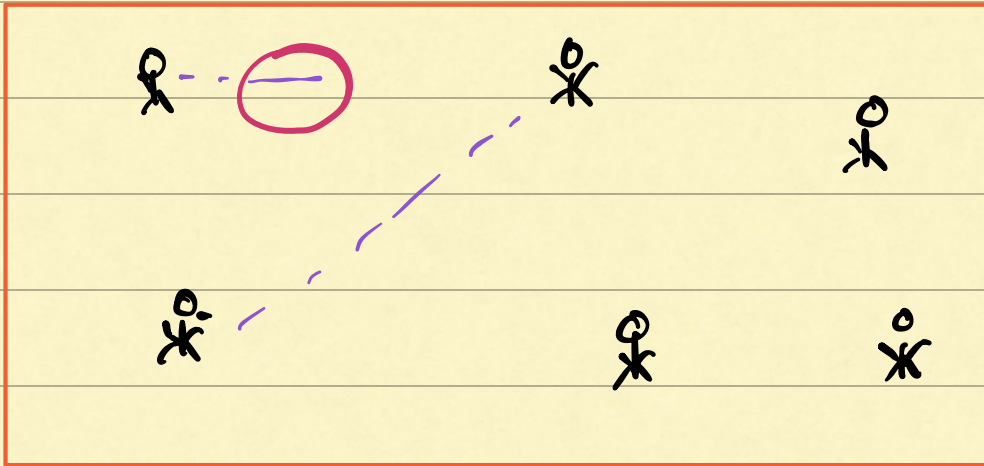
n = new mail(n);

③ logger → File logger Distributed logger

+ Addons : { sensitive logger -
debug logger -
error logger
info logger

Flyweight :

PUBG



100 players \rightarrow 10 guns \rightarrow 100 bullets.

class Bullet {

color : 8B

weight : 8B

radius : 8B

maxDamage : 8B

direction : 24B

speed : 2B

maxRange : 8B

current Co-ord : 24B

target Co-ord : 24B

image-of-bullet : $\sim 1KB$

}

\rightarrow 100,000 bullets

72B + 48B + 1KB

0.1KB + 1KB

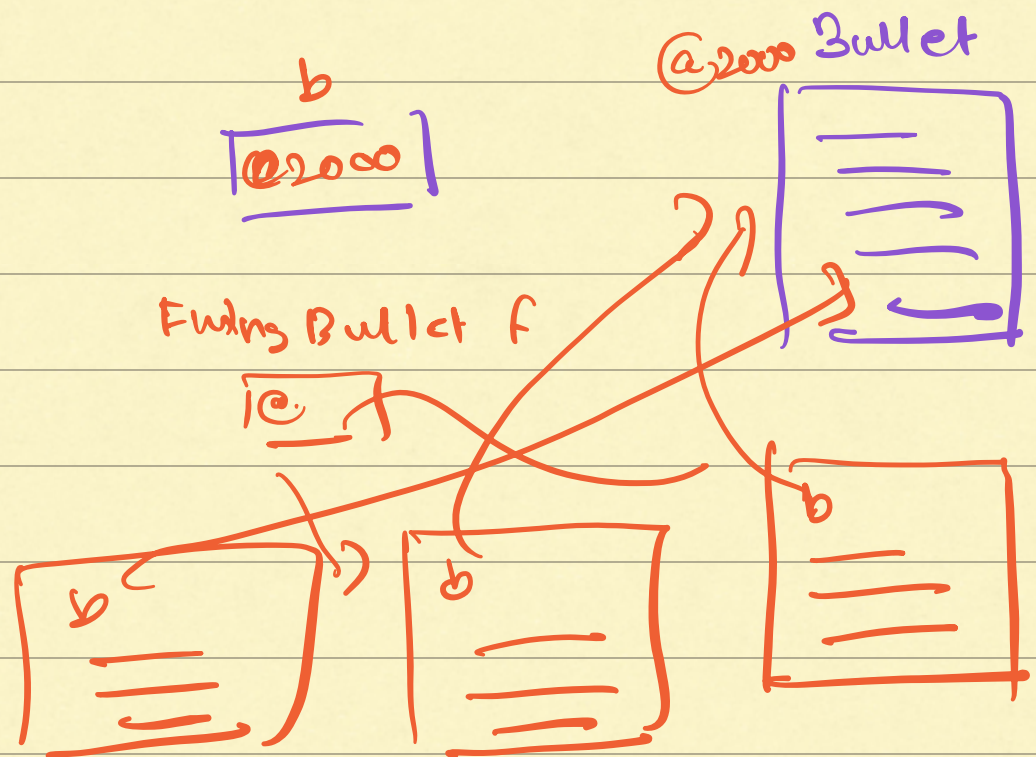
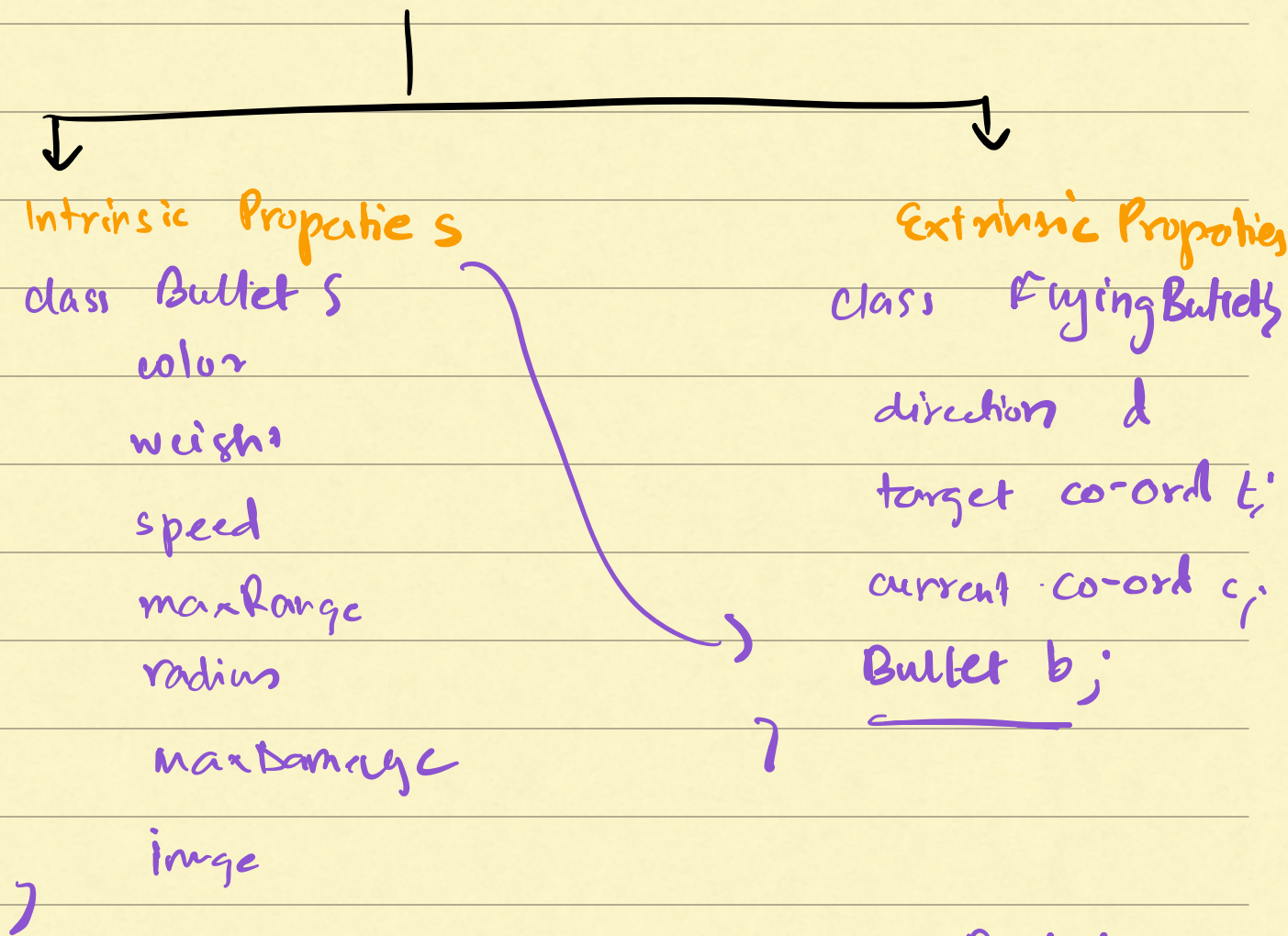
\downarrow

1.1 KB.

$10^5 \times 1.1 \text{ KB}$

110 MB

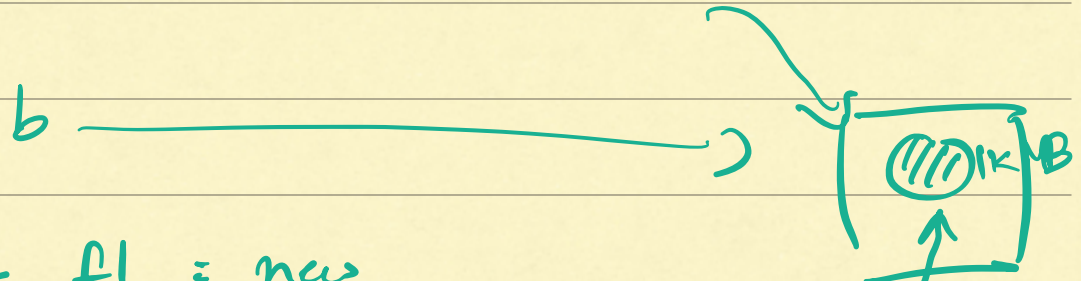
Flyweight Design Pattern :



100000 \rightarrow 1KB + $10^5 \times 0.1$ KB

$$1 \text{ KB} + 10 \text{ MB} \\ = \underline{10 \text{ MB}}$$

Bullet b = new Bullet(.....);



Flying Bullet fl = new
- FlyingBullet(b,);

Flying Bullet fl = new
- FlyingBullet(b,);

