OOPS - 3

{ Abstraction
Inheritance
Polymorphism
Encapsulation }

INHERITANCE

Parents → Children

[Money, traits]
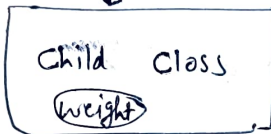
In OOPs

Base Class

l, w, h
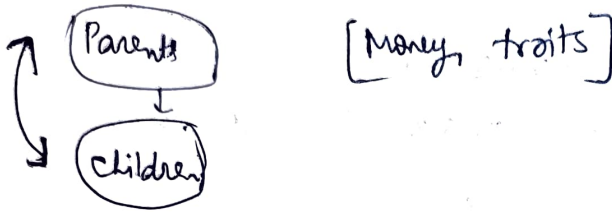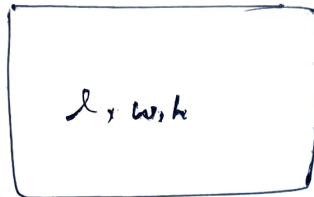
derived from Base Class

Child Class
(weight)

Parent	Child
Length	✓
Trait	✓ + extra
Money	✓

Using Extends keyword

```
class child extends Base {

    int weight

}
```

Child child = new Child()

Child. length;

Child. w;

Child. h;

(Class child extends Parent)

Species
on

human   fish

Huma Aklu = new Human ( )
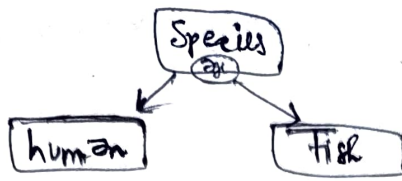
Initalise parent class variable also

Inheritance

Box   Box weight

l, w, h   access all   weight extra
              can't access
              any
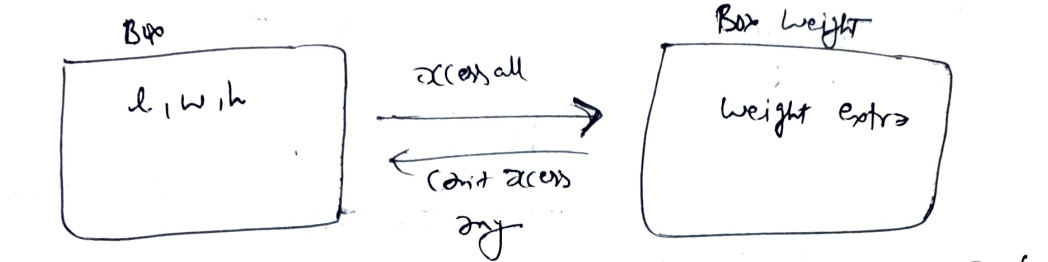
class Box   Class BoxWeight extends Box
                                       double Weight ( );

          can be access only   public
          in same file

3
Can't access private things   not will be private for Bo

super (l, w, h)   ← use to
l ← private in A class

Box box 5 = new Box weight (2, 3, 4, 8)   Type of
Sup (box 5. weight);   _____
                                                Reference Variable
Member's access is determined by ⌐ Not by object
                                  ⌐

box s   Box wa

Box weight box6 = new Box (4, 3, 9)

Refriz ⌐ Parent ——→ child
        ⌐ child ——→ parent

[A]

Super ___ref→ Object Class

[Obj] Superclass

[A] Intern of

[B]

Sk ref to A

[B] Implementation

[C]
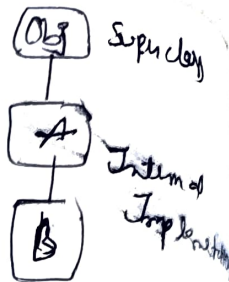
Super keyword used in this class will be referring to B

Default Super constructor will be called.

Types of Inheritance

1) Single Inheritance

2) Multilevel Inheritance

3. Multiple Inheritance

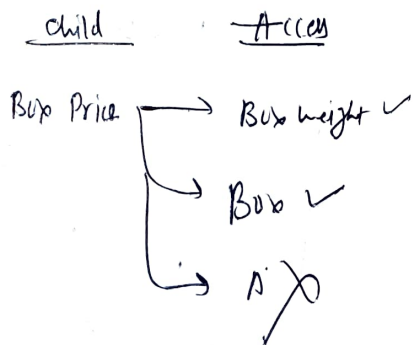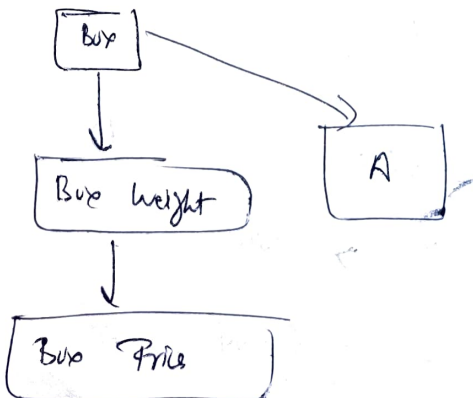One class extends another class

Box
↓
Box Weight
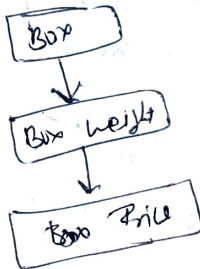
@override

Box
↓
Box Weight
↓
Box Price

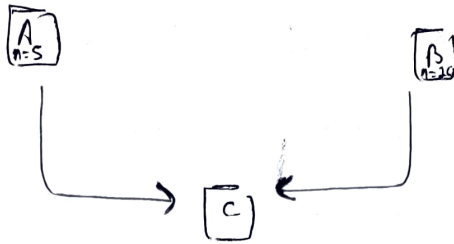↳ Both Parent class & child class has same method name, return type, & parameters in both parent & child class

Access of Child Class

Box
↓   ↘
Box Weight   [A]
↓
Box Price

child   Access

Box Price → Box Weight ✓
          ↘ Box ✓
          ↳ A ✗

super class → Constructor just assume it

③ Multiple Inheritance

One class extending more than one classes

```
[A]        [B]
n=5        n=20
  |          |
  └──→ [C] ←──┘
```

C obj = new C();

C.n // ?   ?   i.e. java does not support this

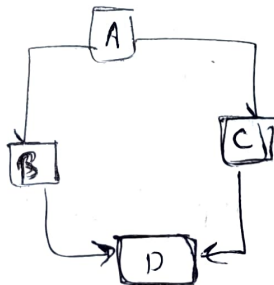**④ Hierarchical Inheritance**

One class is Inherited so many

classes

```
           [AA]
        ┌────┼────┐
       [B]  [C]  [D]
```
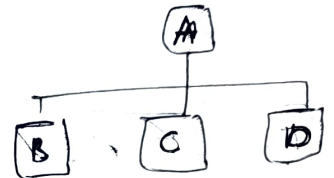
Note = Up —→ down   ✓

up —→ down —→ down   ✗

⑤ Hybrid Inheritance

Combination of Single & Multiple Inheritance

Not in java.

```
        [A]
       /    \
     [B]    [C]
       \    /
        [D]
```

⑥ Cyclic Inheritance

```
   ┌→[Bbv]
   └────┘
```

Not allowed   ✓