OOP4 Interface And Abstract Class

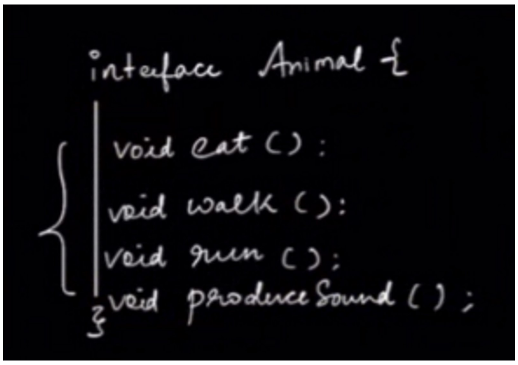
30 May 2024 20:57

Agenda :

1. Interfaces
2. Abstract Classes
3. Static

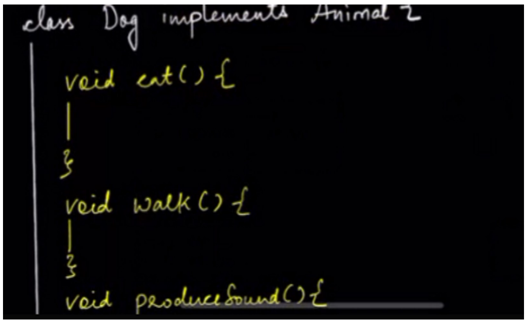
1. Interface

- **Class :** Blueprint of an real world entity.
- **Interface :**
  - A concept that is just categorised by type of behaviour it supports.
  - Blueprint of a behaviour
  - Only declaration and not implementation.
  - Inheritance can exists in between interfaces.
- The interface body can contain abstract methods, default methods, and static methods.



```
interface Animal {
    void eat ( ) :
    void walk ( ):
    void run ( ):
    void produceSound ( ) ;
}
```

- Once Class implements interface it will have to implement all methods of interface.



```
class Dog implements Animal {
    void eat() {
    }
    void walk() {
    }
    void produceSound() {
```

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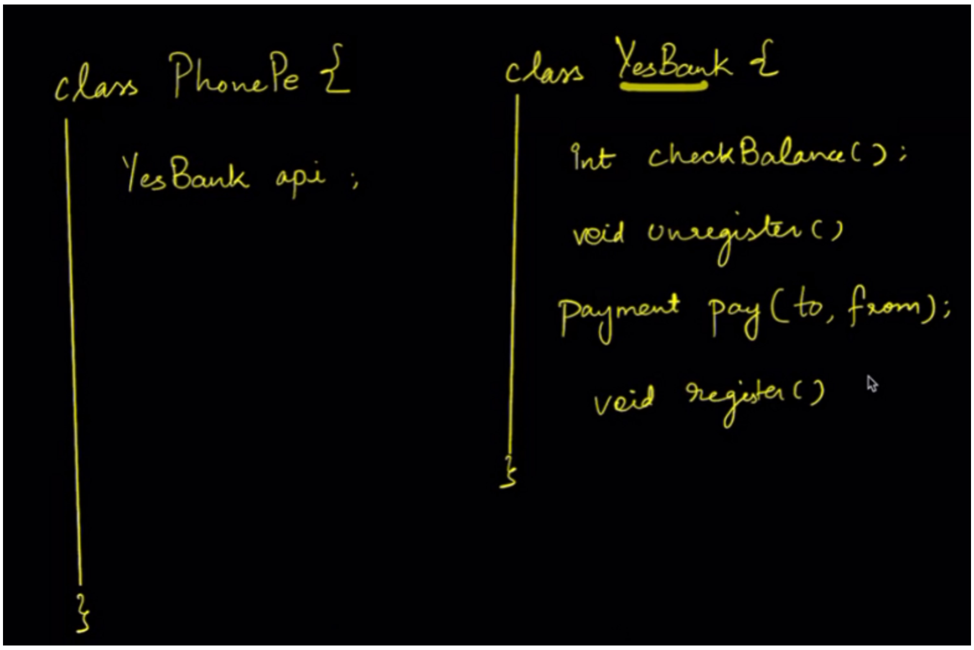
Principle :- Program to interface and not implementation.

Case : PhonePe



```
class PhonePe {
    YesBank api ;
}
```

```
class YesBank {
    int checkBalance();
    void unregister()
    Payment pay(to, from);
    void register()
}
```

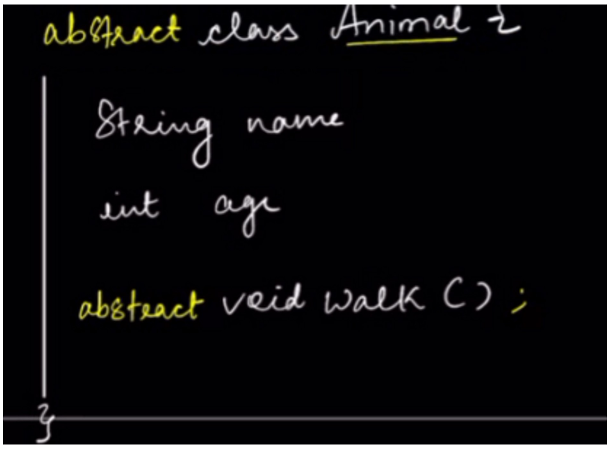
Every time PhonePe changes the bank it will have to change the implementation.

So RBI came with the common interface which was implemented by different banks, and can be used by different merchants, so that every time whole change is not required.

"So System must be loosely coupled."

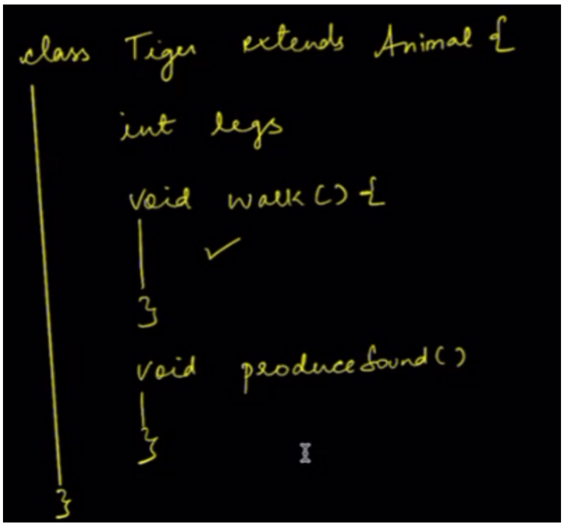
2. Abstract Class

- Class With attributes and behaviour (not implemented) is known as abstract class.
- When we are not sure about the behavioural implementation we use a abstract class.

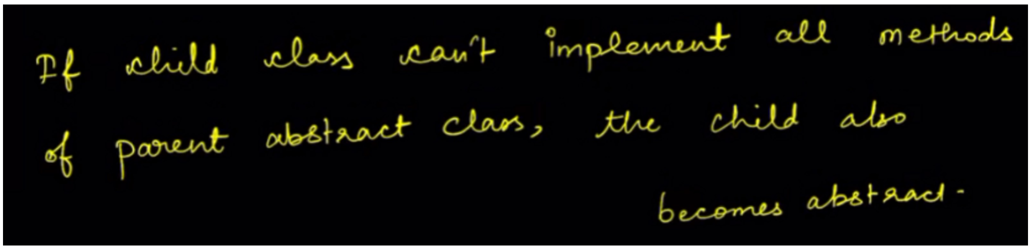


```
abstract class Animal {
    String name
    int age
    abstract void walk() ;
}
```

- Abstract class without attributes is a interface only.
- Class with even a one abstract method (Method Without definition) is a abstract class.
- We can not create objects of abstract class.

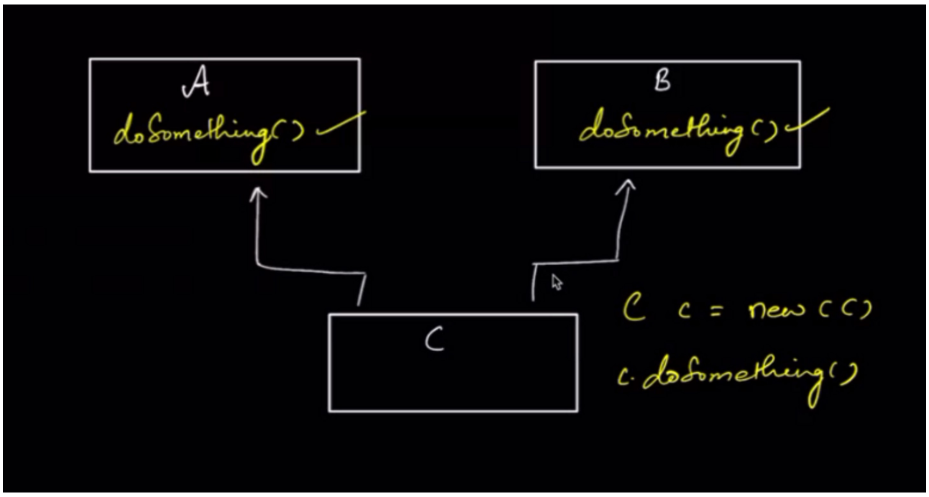


```
class Tiger extends Animal {
    int legs
    void walk() {
        ✓
    }
    void produceSound()
    }
}
```



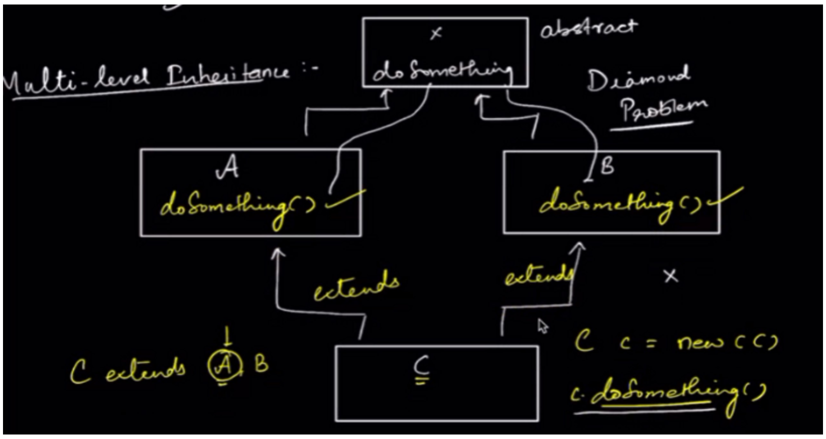
If child class can't implement all methods of parent abstract class, the child also becomes abstract.

Multilevel Inheritance : java doesn't support multi level inheritance. One class can extend only one method.



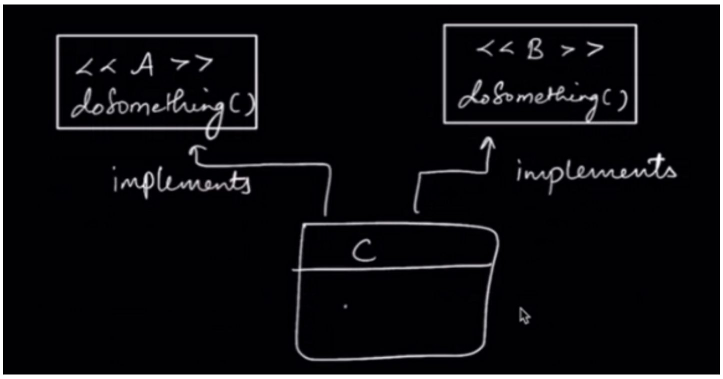
```
C c = new C()
c.doSomething()
```

(Diamond Problem)



```
C c = new C()
c.doSomething()
```

- **But a class can implement multiple interfaces.**
- **Since interface doesn't have implementation the class implementing interfaces have the implementation for common method of both the interface.**



3. Static

- Static is a keyword used
- We can access static method without object of the corresponding class.
- We can have static variable, method or classes (specific to nested inner class)

https://www.geeksforgeeks.org/static-keyword-java/