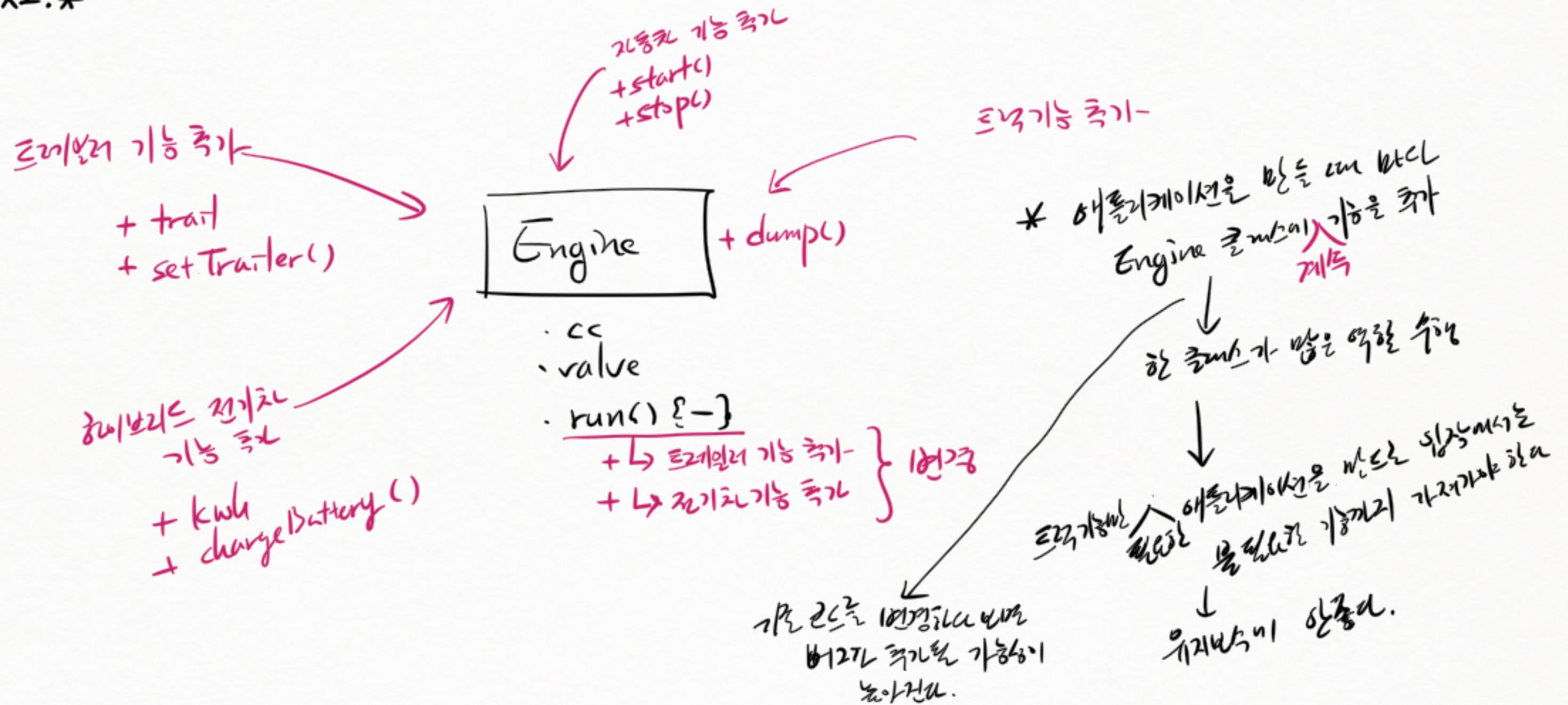


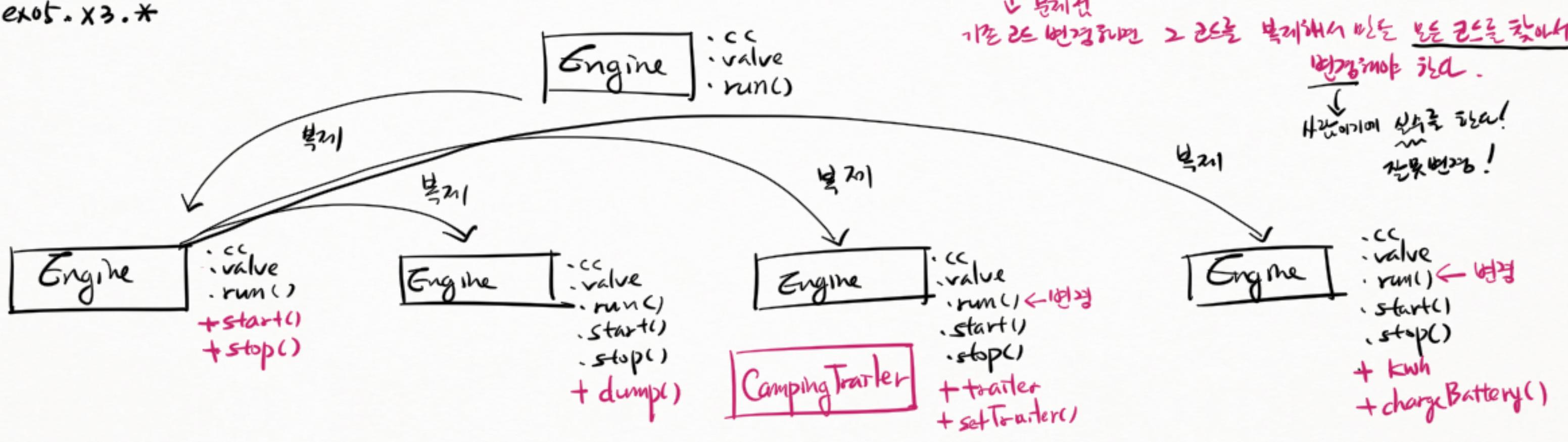
* 기능 확장 방법 1 - 기존 코드에 새 기능 추가

oop.ex5.x2.*



* 기능 확장 방법 2 - 복제한 코드에 새 기능 추가

oop.ex05.*



① 자동차 만들기
app1

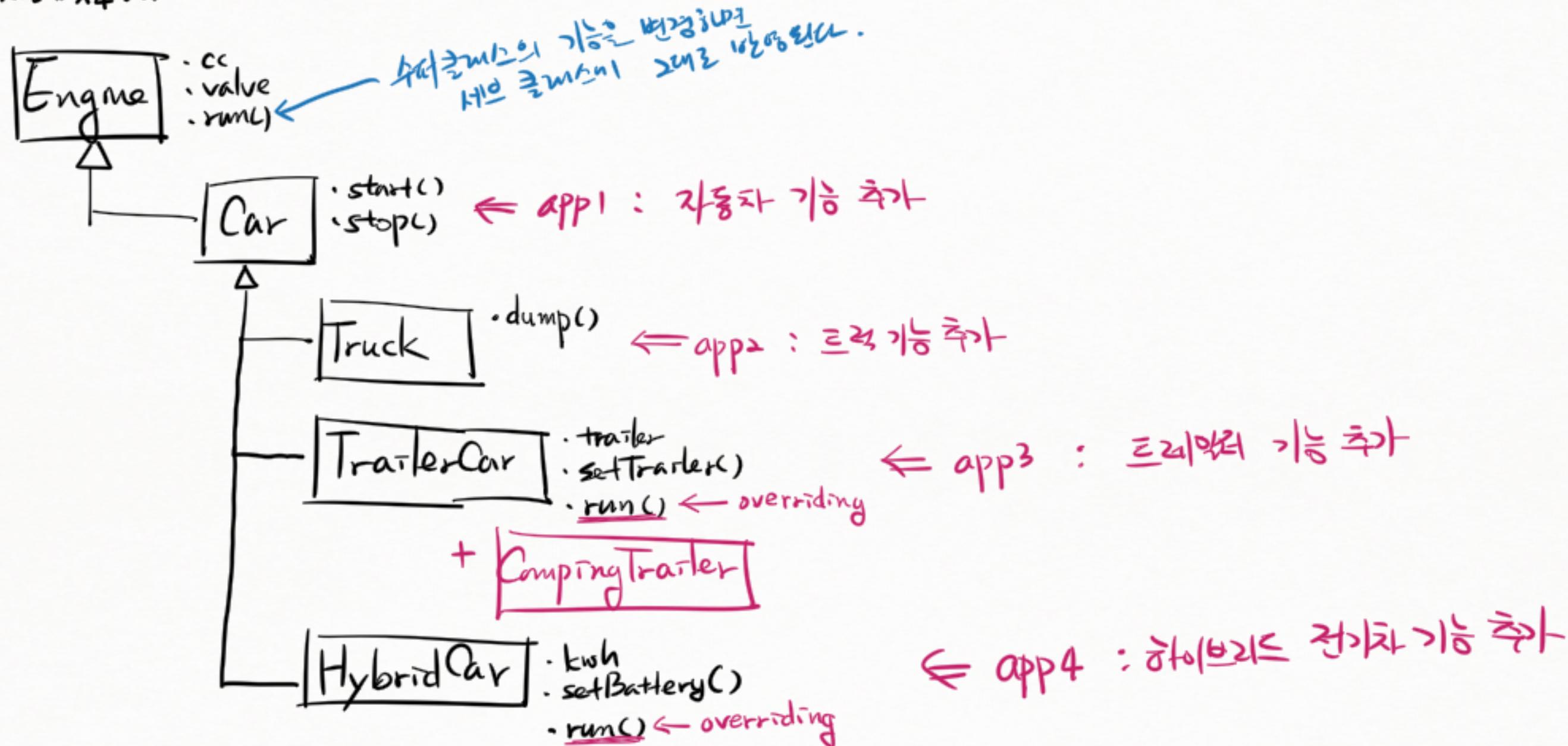
② 트레일러 만들기
app2

③ 캠핑카 만들기
app3

④ 하이브리드 전기차 만들기
app4

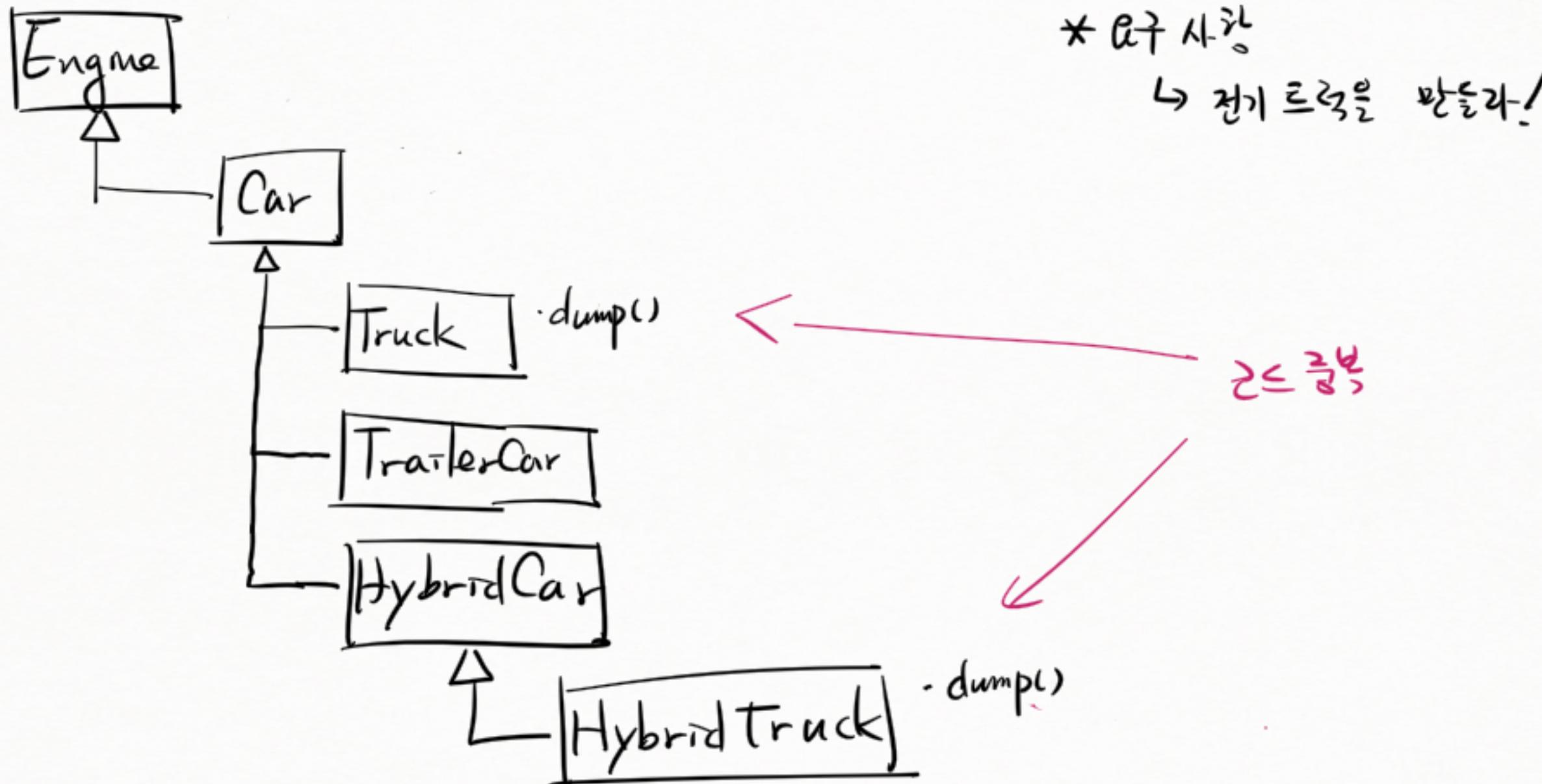
* 기능 확장 방법 3 - 상속을 이용한 확장.

oop.ex05.x4.*



* 기능 확장 방법 3 - 상속을 통한 기능 확장의 한계

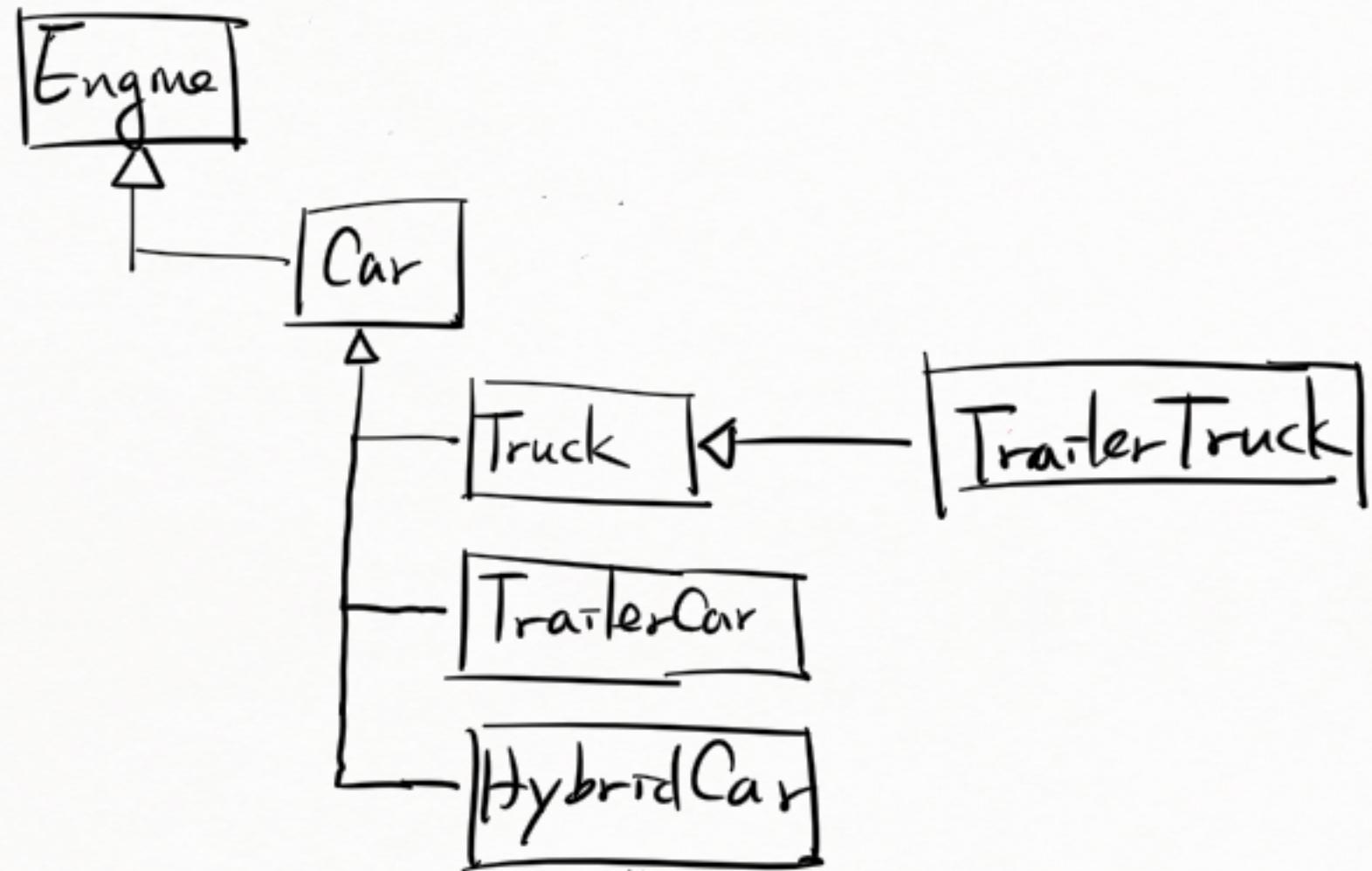
oop.ex05.x4.*



* 기능 확장
↳ 전기 트럭을 만들라!

* 기능 확장 방법 3 - 상속을 통한 기능 확장의 한가지

oop. ex05. x4.*



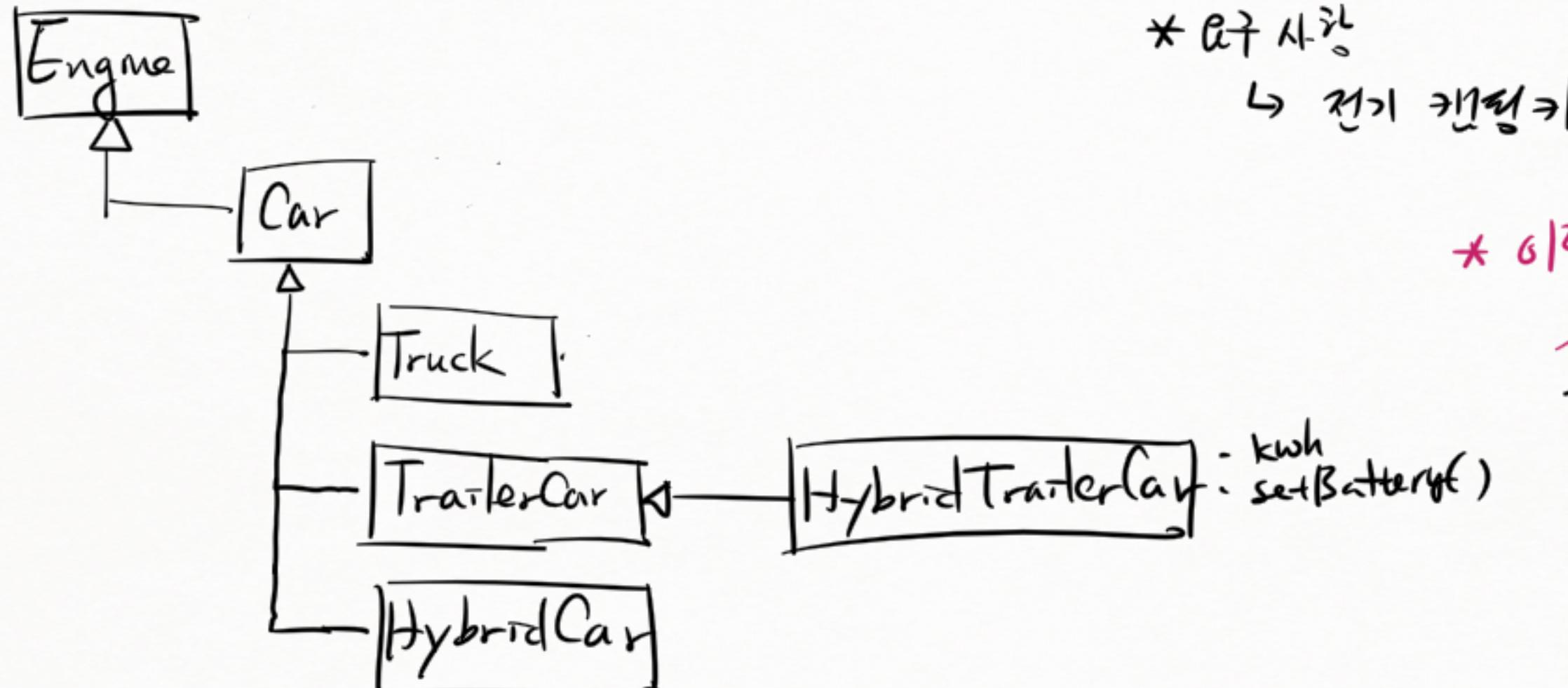
* 구조 사용

↳ 트레일러를 뒤에 두 수 있는 트럭

· trailer
· setTrailer()

* 기능 학습 18주 3 - 상속을 통한 기능 학습의 한계

oop. ex05. x4.*



* 예시 사용

↳ 전기 캐리어카

* 이렇게 기능 조합을 하려면
수행은 네트워크로 구성된다

- kwh
setBattery()

(상속으로 각각의 기능이 조합된
개체를 만들기 어렵다.)

↳ 유지보수는 어렵지만...

* 기능학적 특성 4 : 디자인에서 기초 기능

기능적

Sedan

Truck

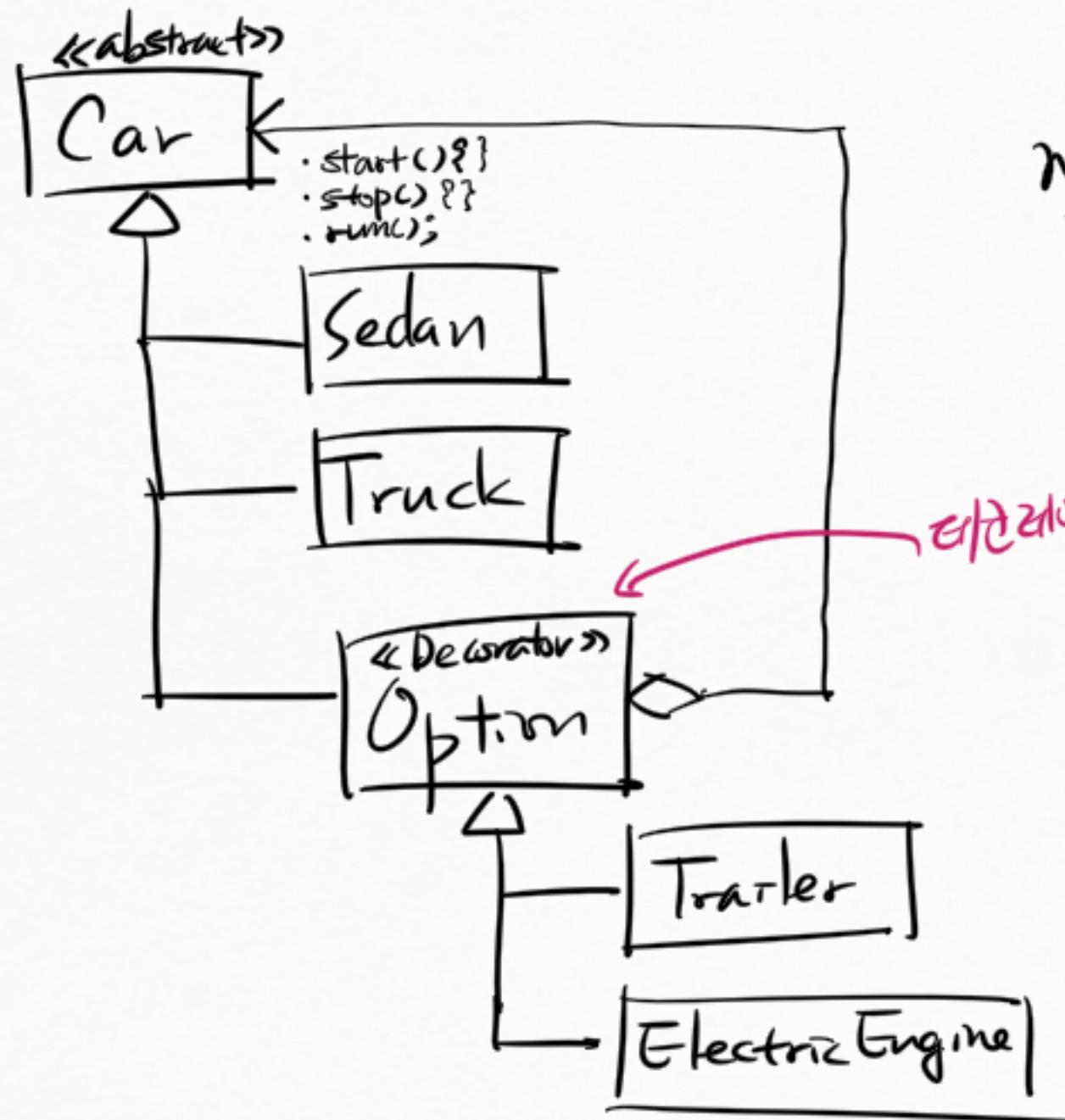
선택적

Gas Engine

Electric Engine

Trailer

* 테러리아 러닝 기법



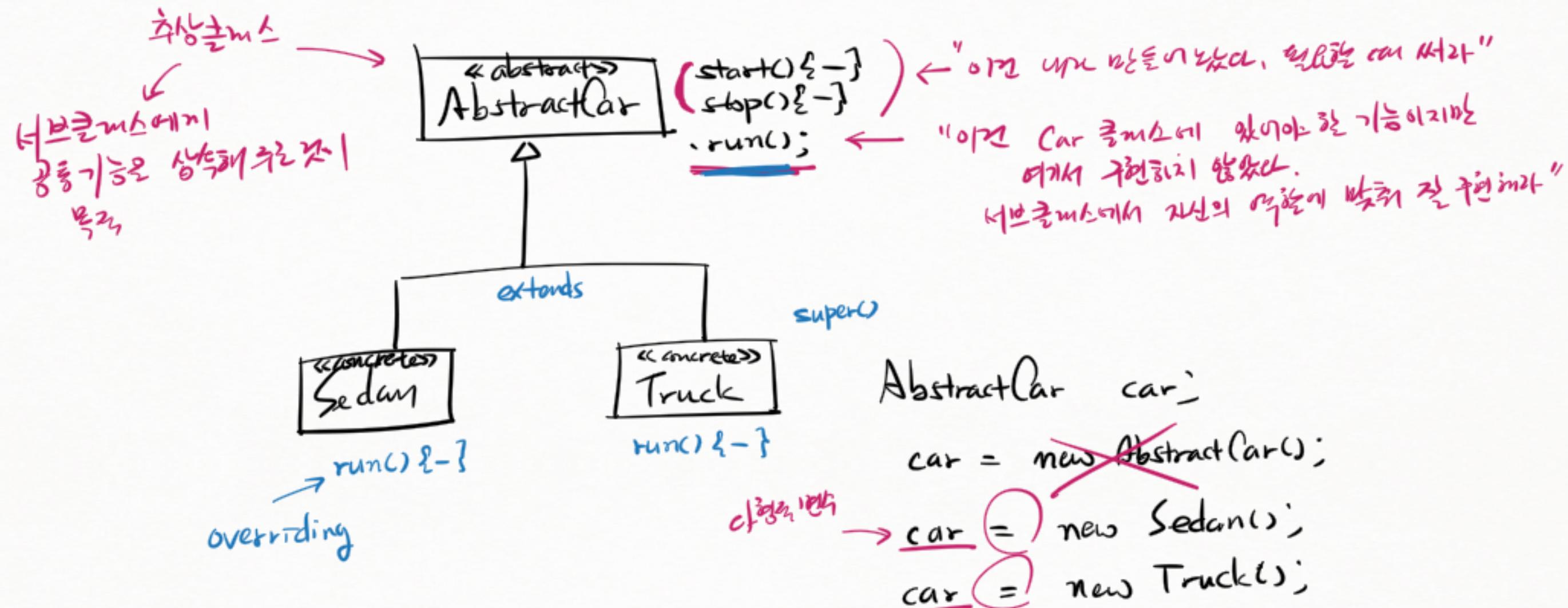
new Optim(new Sedan(new Optim(new ElectricEngine)))

new Optim(new Truck())

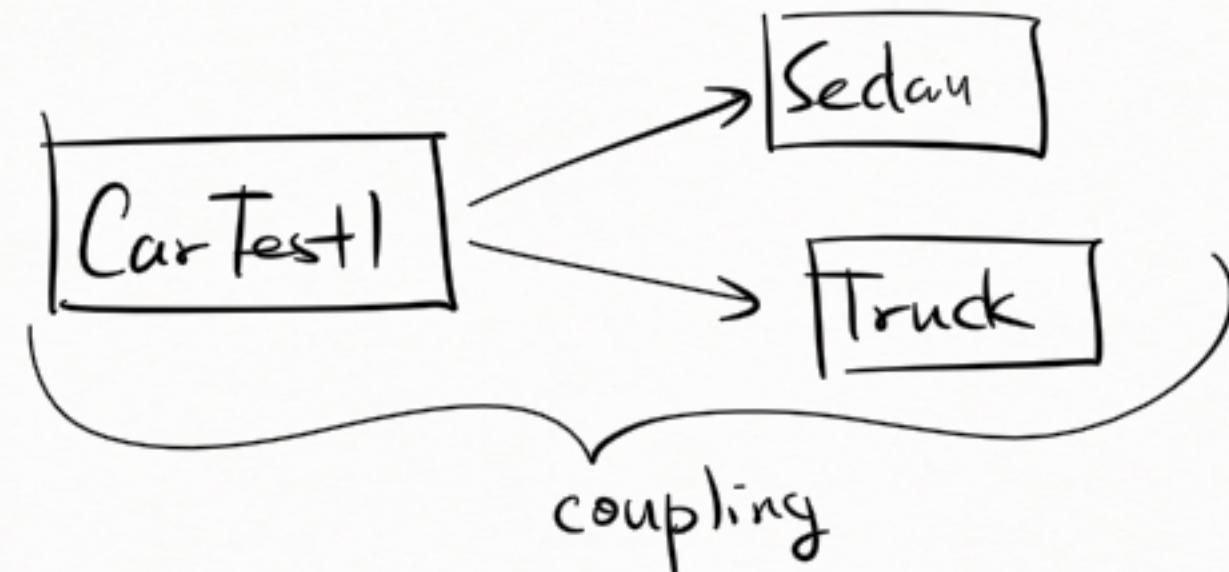
기존
클래스
추가
보다.

디코레이터: 주제에
별도로 선택 가능

* 추상클래스와 구현



* 실전 프로그래밍 1 단계



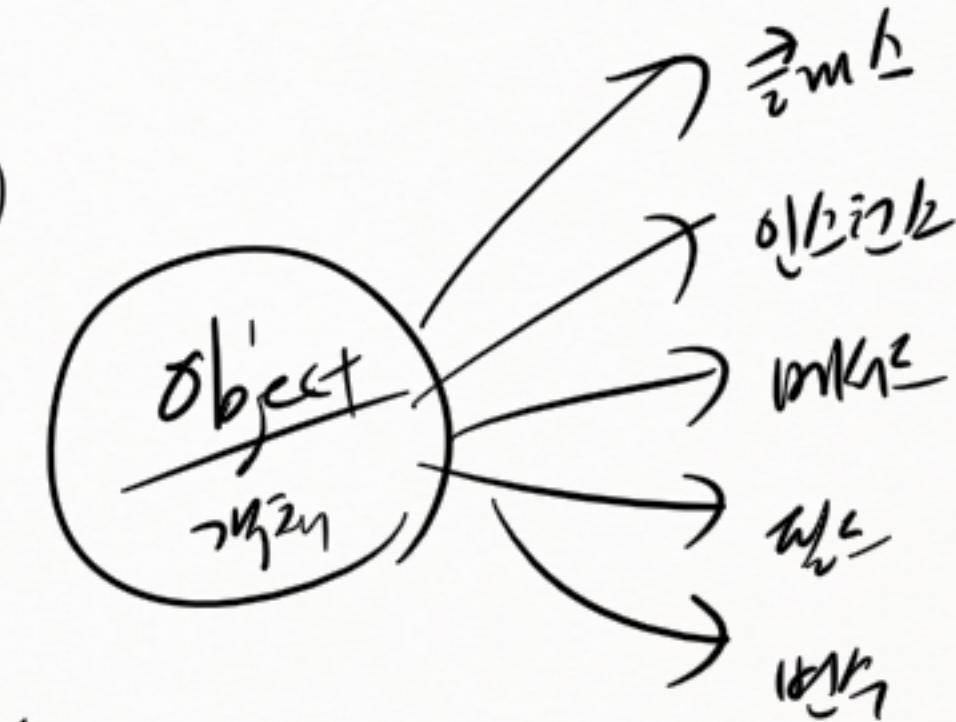
coupling

- openedSunroof
- auto
- **cc value**
- start() { - }
- stop() { - }
- ✓ · run() { - }
- openSunroof() { - }
- closeSunroof() { - }

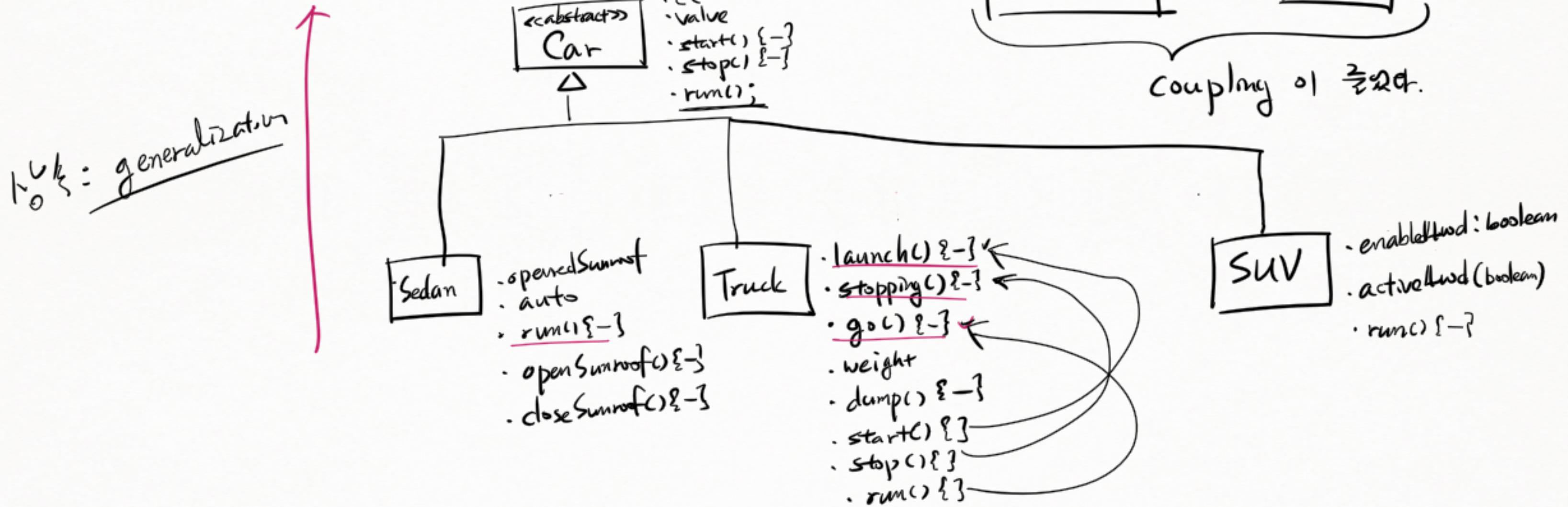
Sedan

- **cc value**
- launch() { - } ✓
- stopping() { - } -
- go() { - } ✓
- weight
- dump() { - }

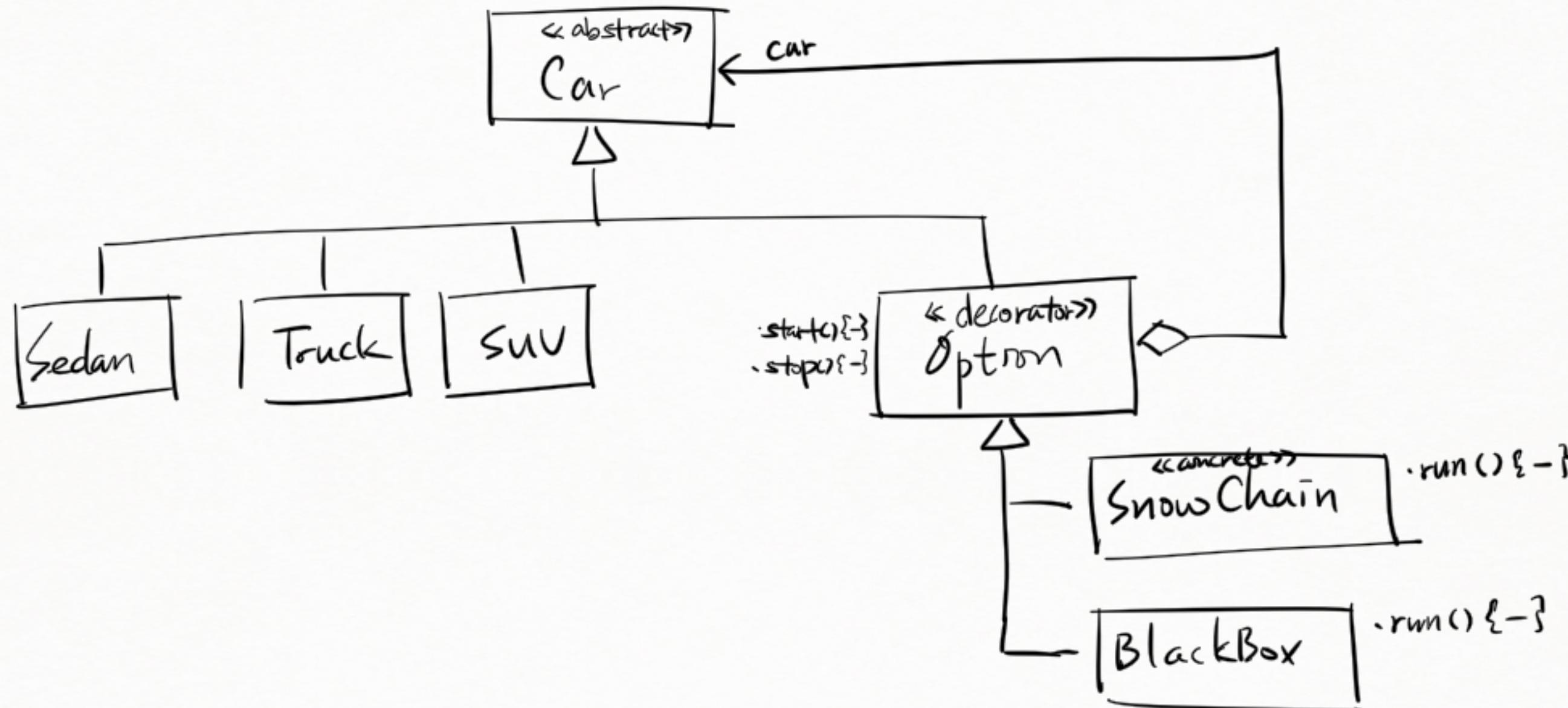
Truck



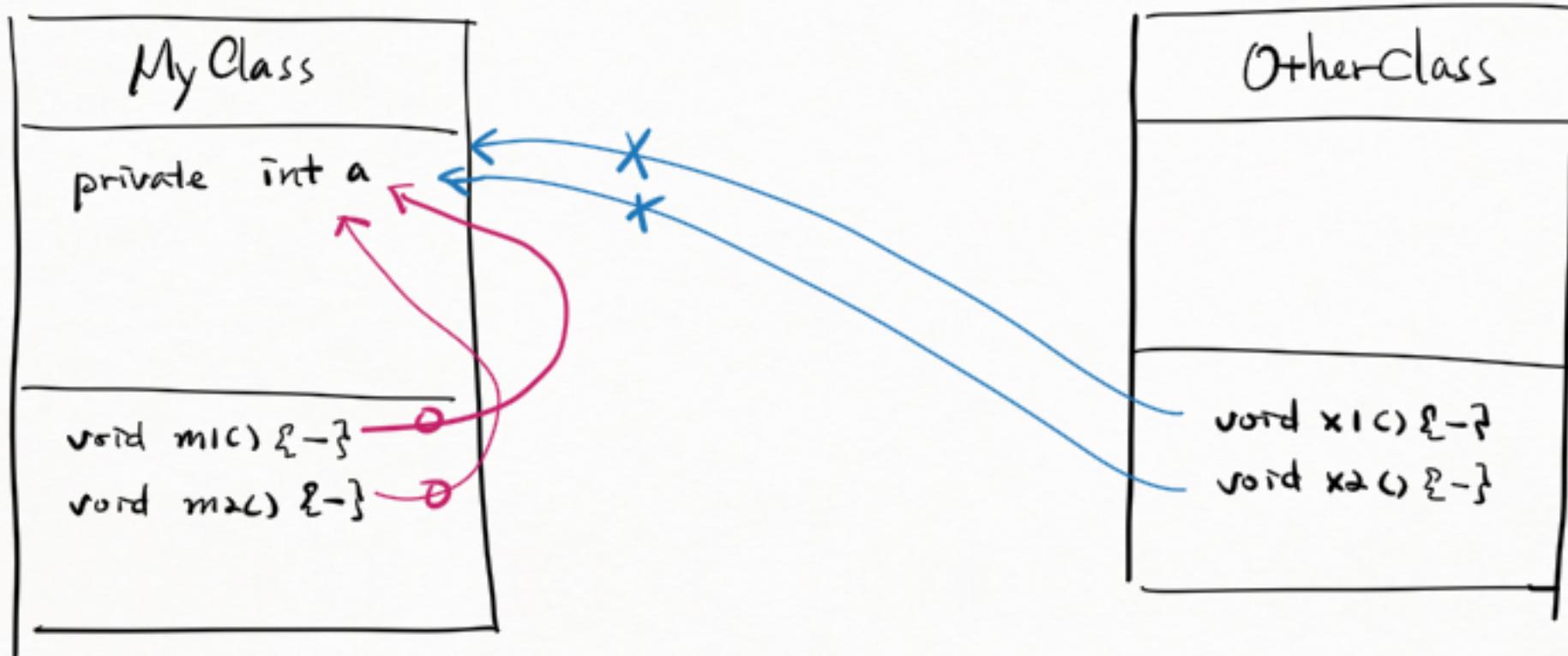
* 상 하 한 한 한 한 한 - 품종, 품질, 성능



* 차선을 3개로 나누면 차량이 1개로 통합

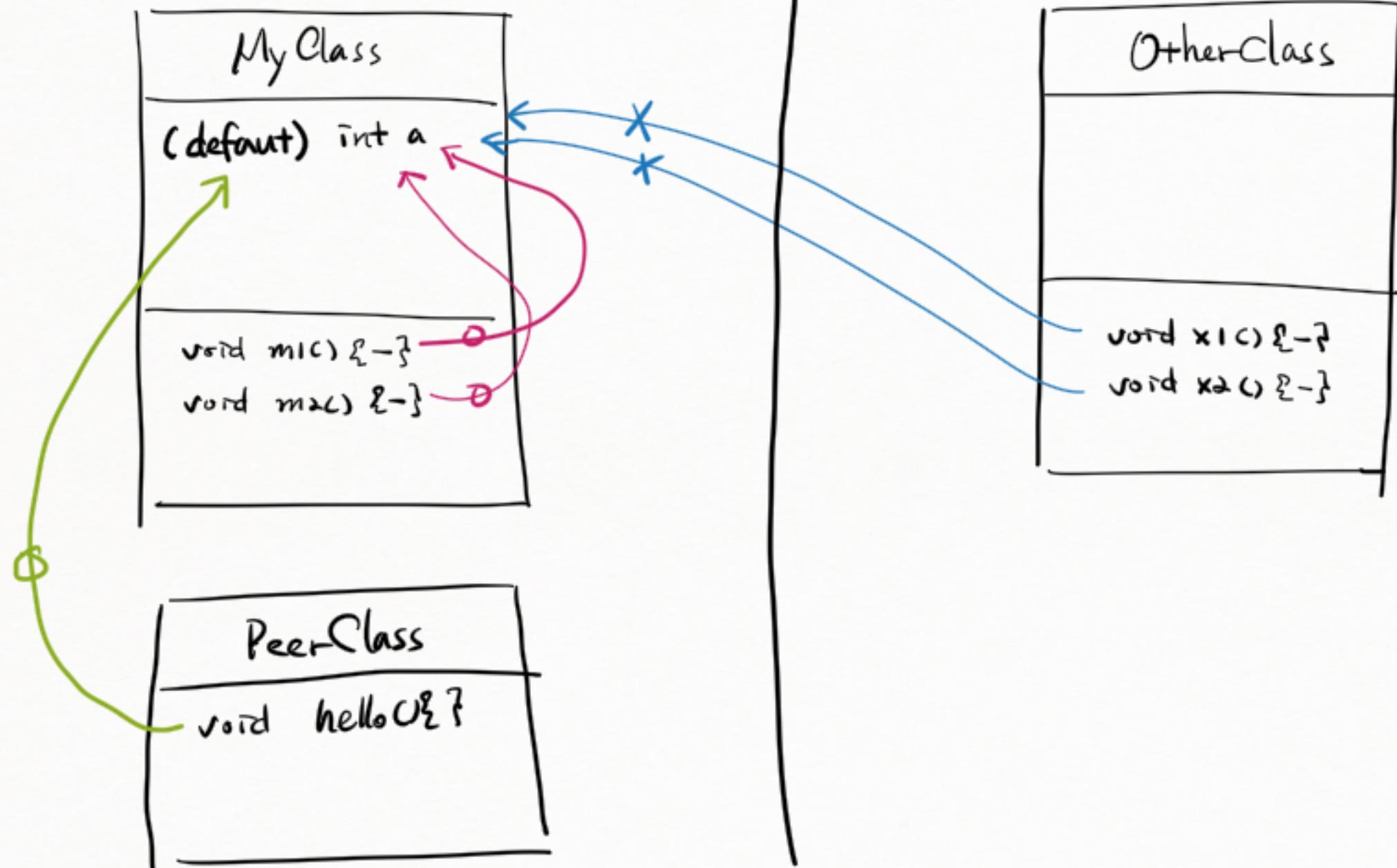


* private - 같은 클래스의 멤버만 접근 가능



* (default) - 같은 클래스의 멤버 접근 가능
+ 같은 패키지 속 클래스의 멤버 접근 가능

com.eomcs.test1



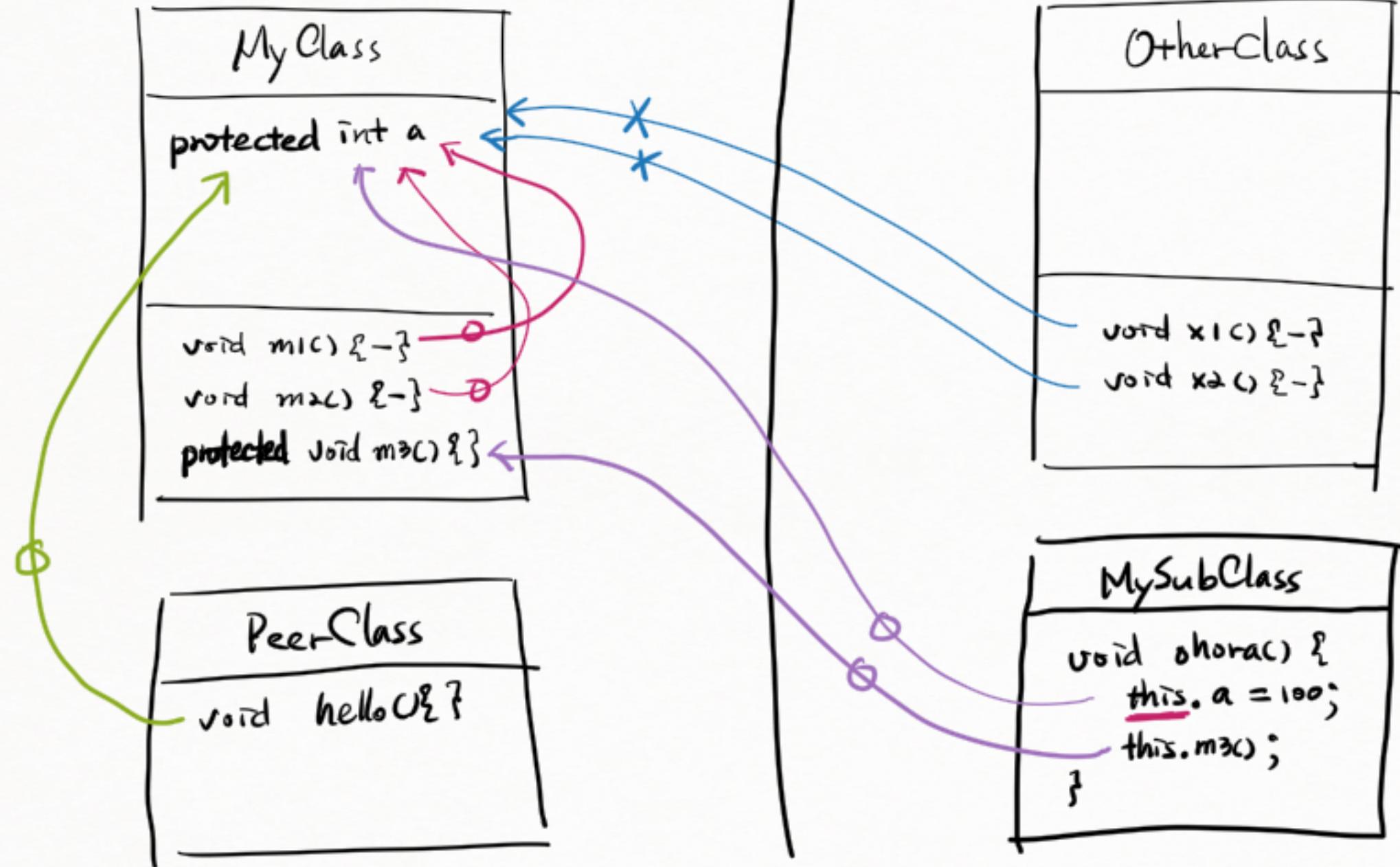
* protected - 같은 패키지 내의 멤버 접근 가능

+ 같은 패키지 속 다른 클래스의 멤버 접근 가능 + 다른 클래스 접근 가능

com.eomcs.test1

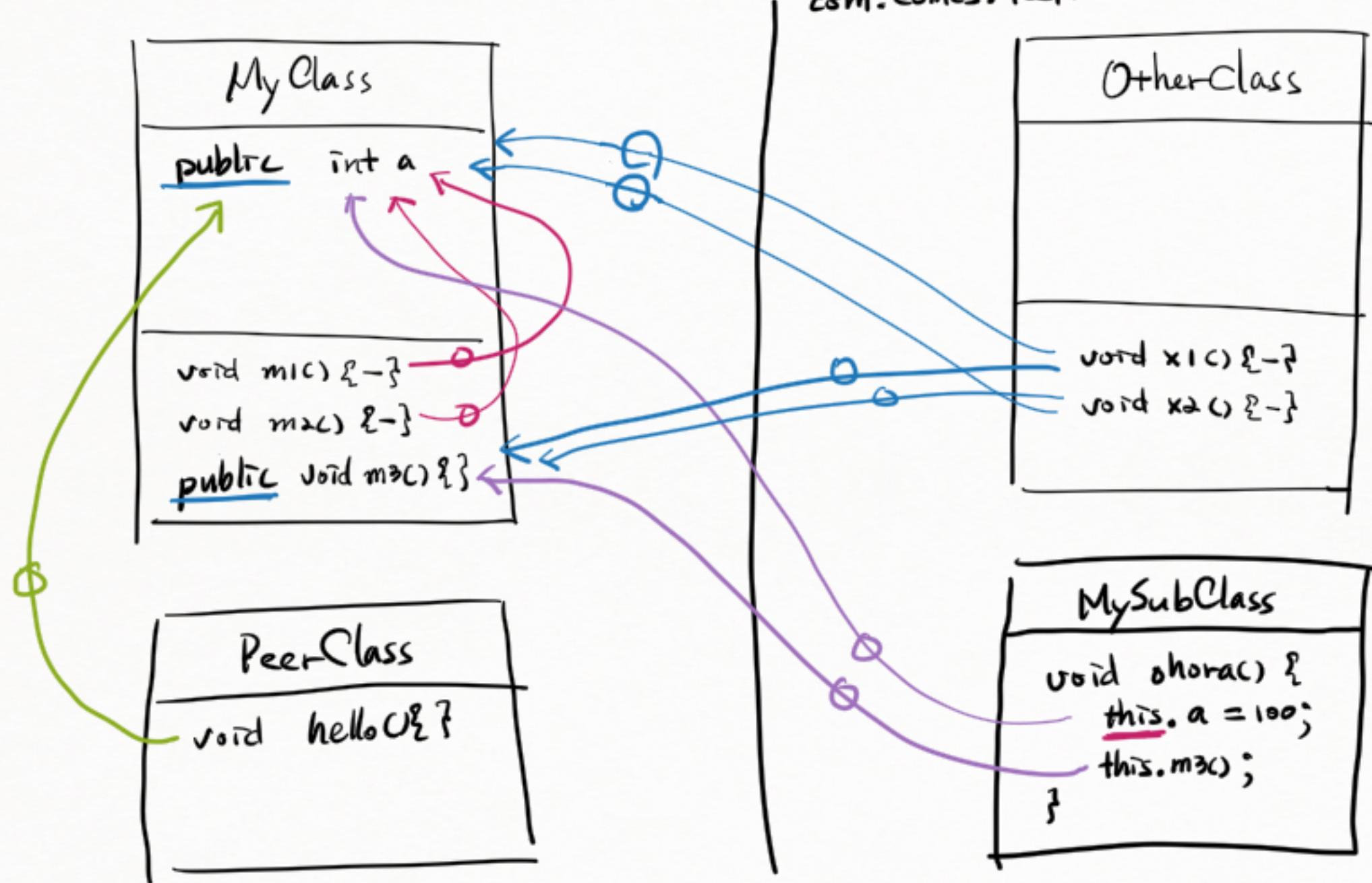
com.eomcs.test2

!!
자신이 상속 받은 멤버와 더불어
자신이 상속 받은 멤버와 더불어

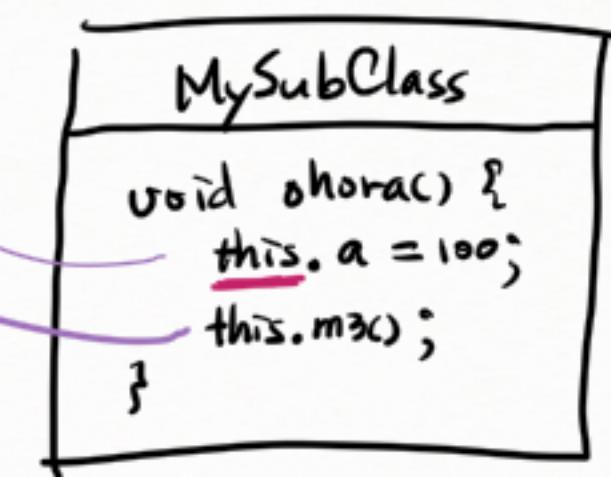
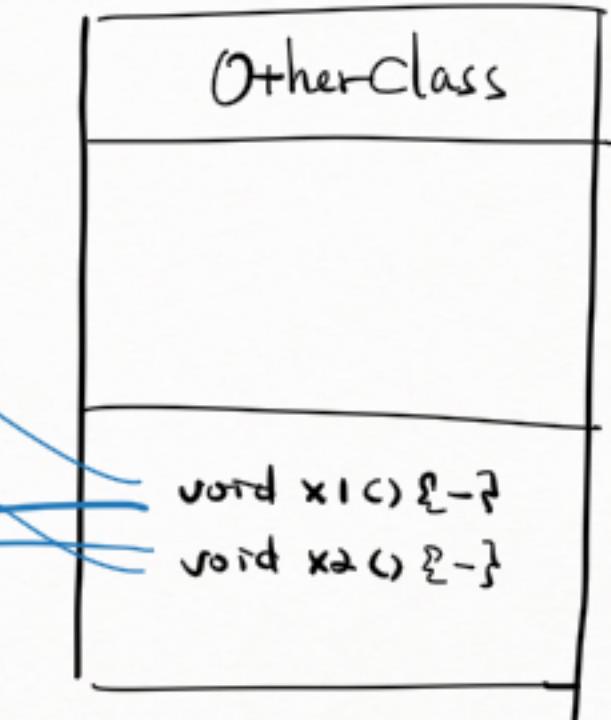


* public - 모든 멤버 접근 가능

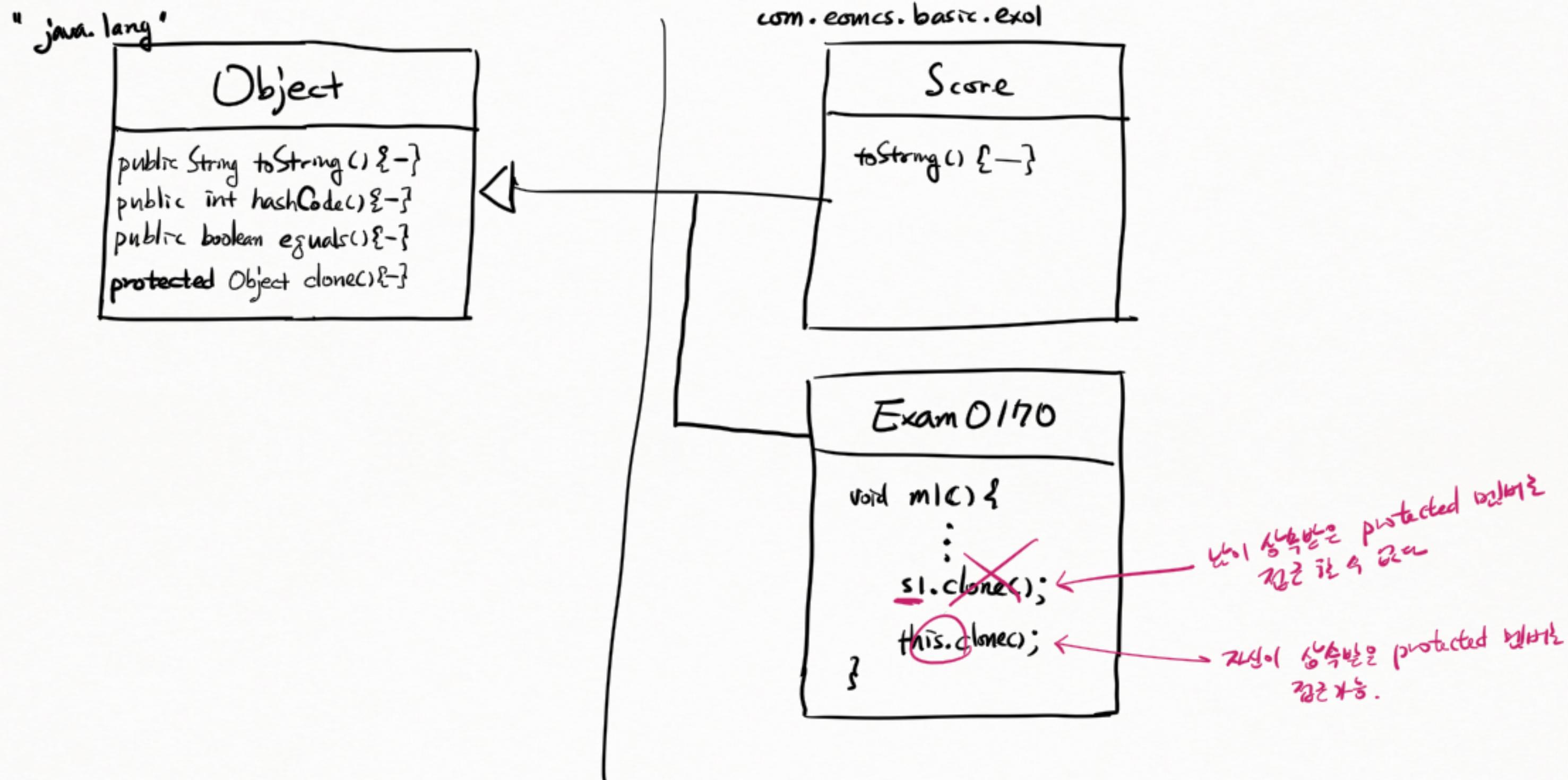
com.eomcs.test1



com.eomcs.test2

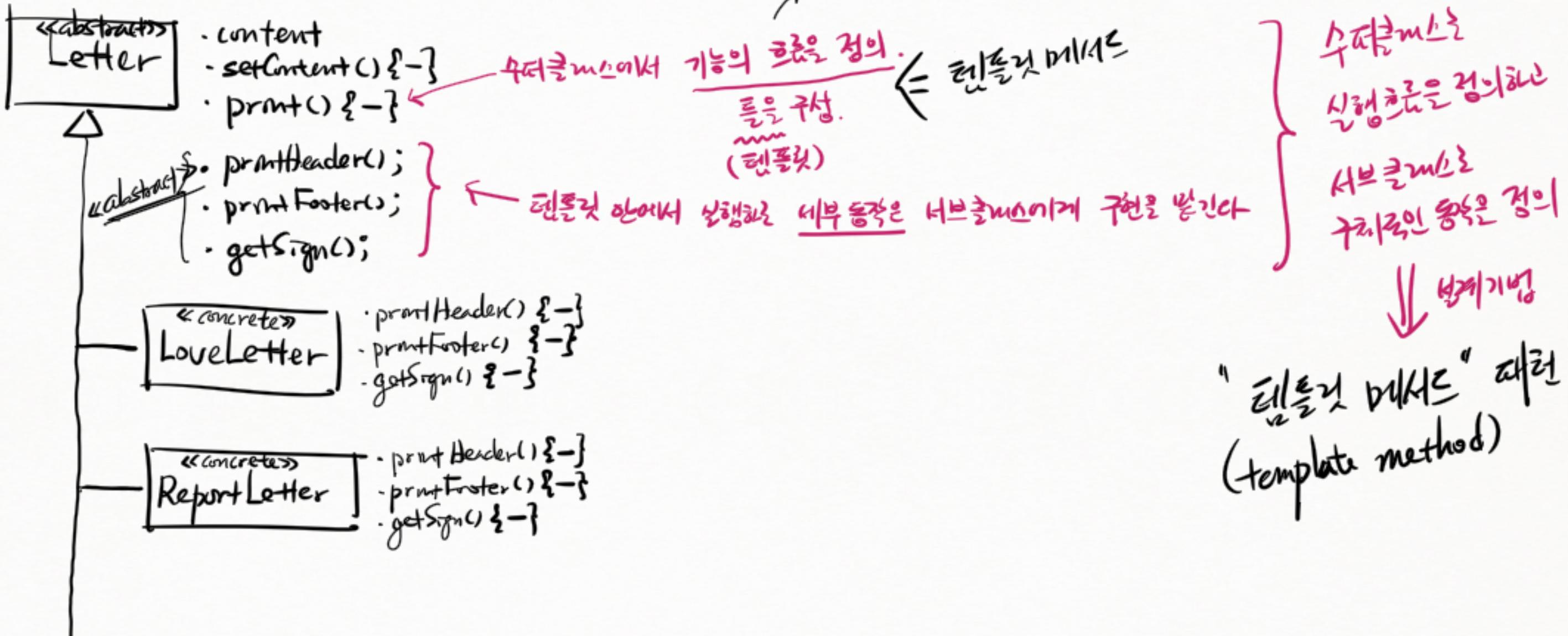


* clone 데일



* 추상클래스

the skeleton of an algorithm



* 추상 클래스와 추상 메서드의 활용

① 각각 단일의 클래스 사용

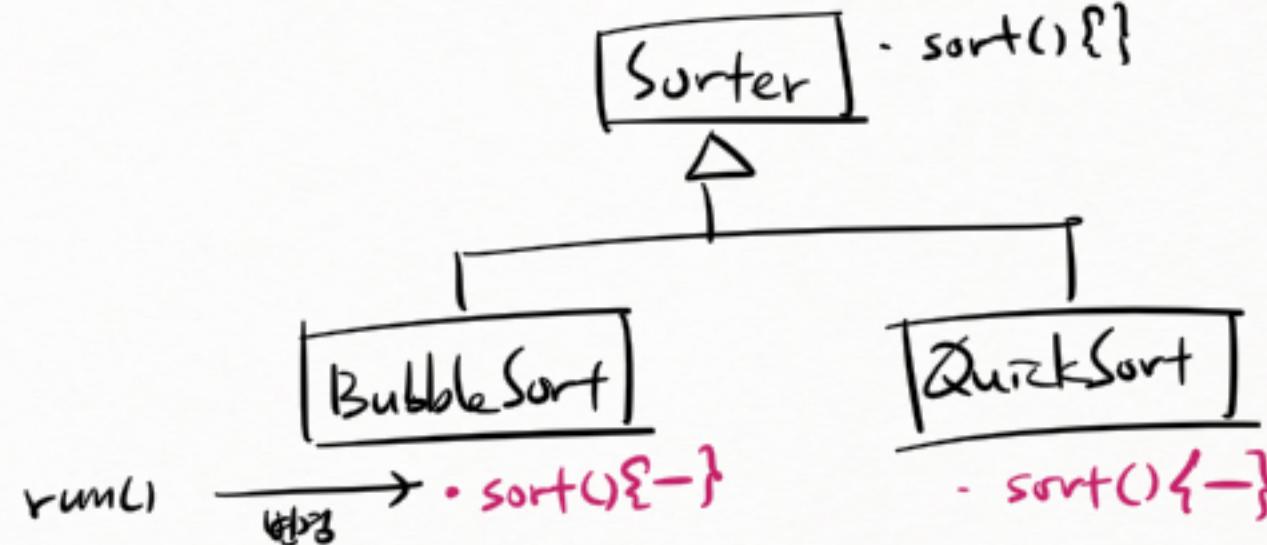


• run()
 ↗
 두 개의 정렬 클래스를 같은 부류가 아니기 때문에
 같은 메소드인 print() 메서드를 사용할 수 없다.
 다른 이름으로 사용.

- display(BubbleSort, int[]){-}
- display(QuickSort, int[]){-}

개선

② 같은 단일의 클래스로 초기화



run()

→ sort(){-}

sort(){-}

같은 단일화된
print()를 두 클래스에 사용 가능.

• display(Surter, int[]){

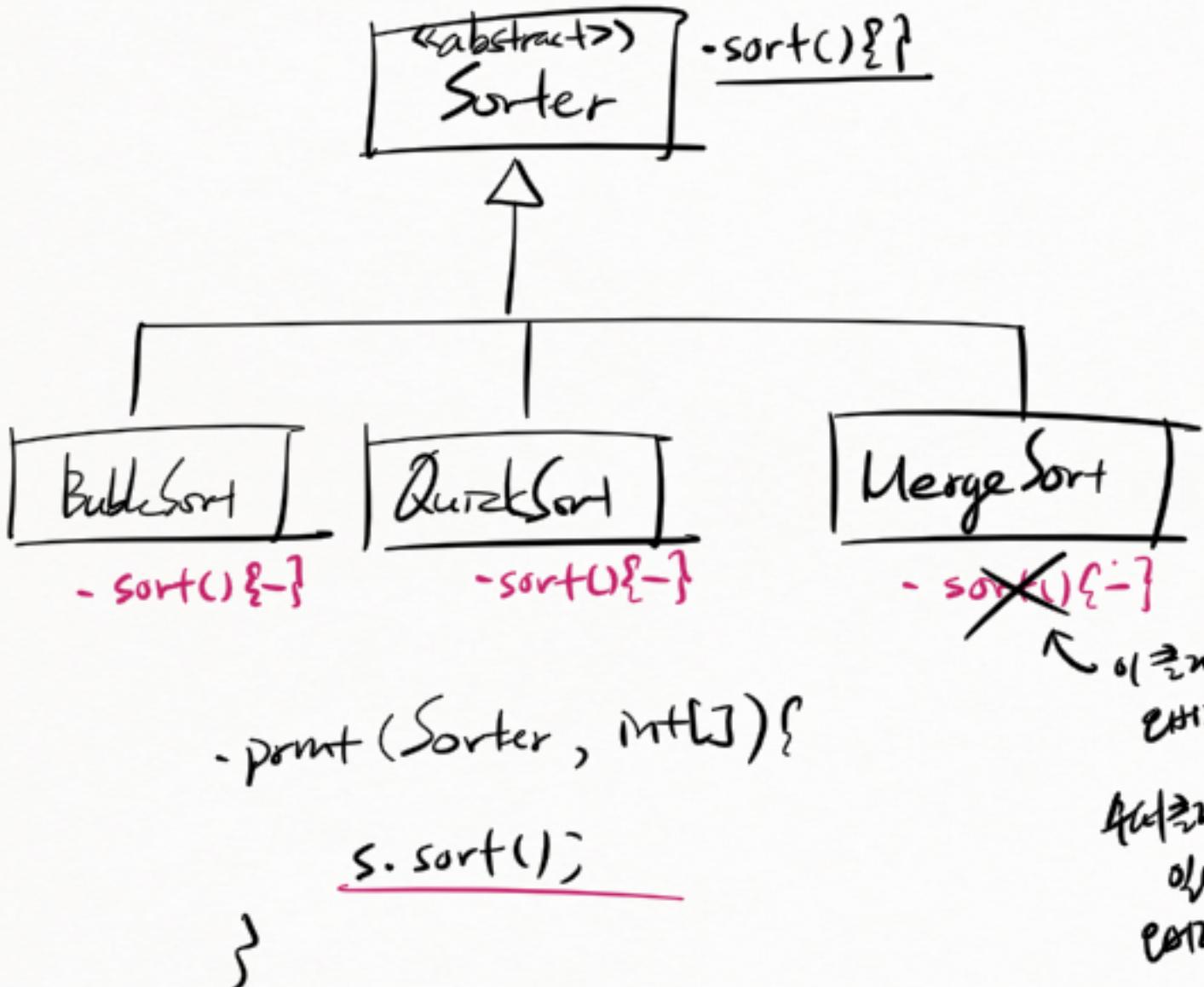
s.sort(); ←

클래스에 상관없이
같은 이름의 메서드 사용
이 가능하다는 것이다

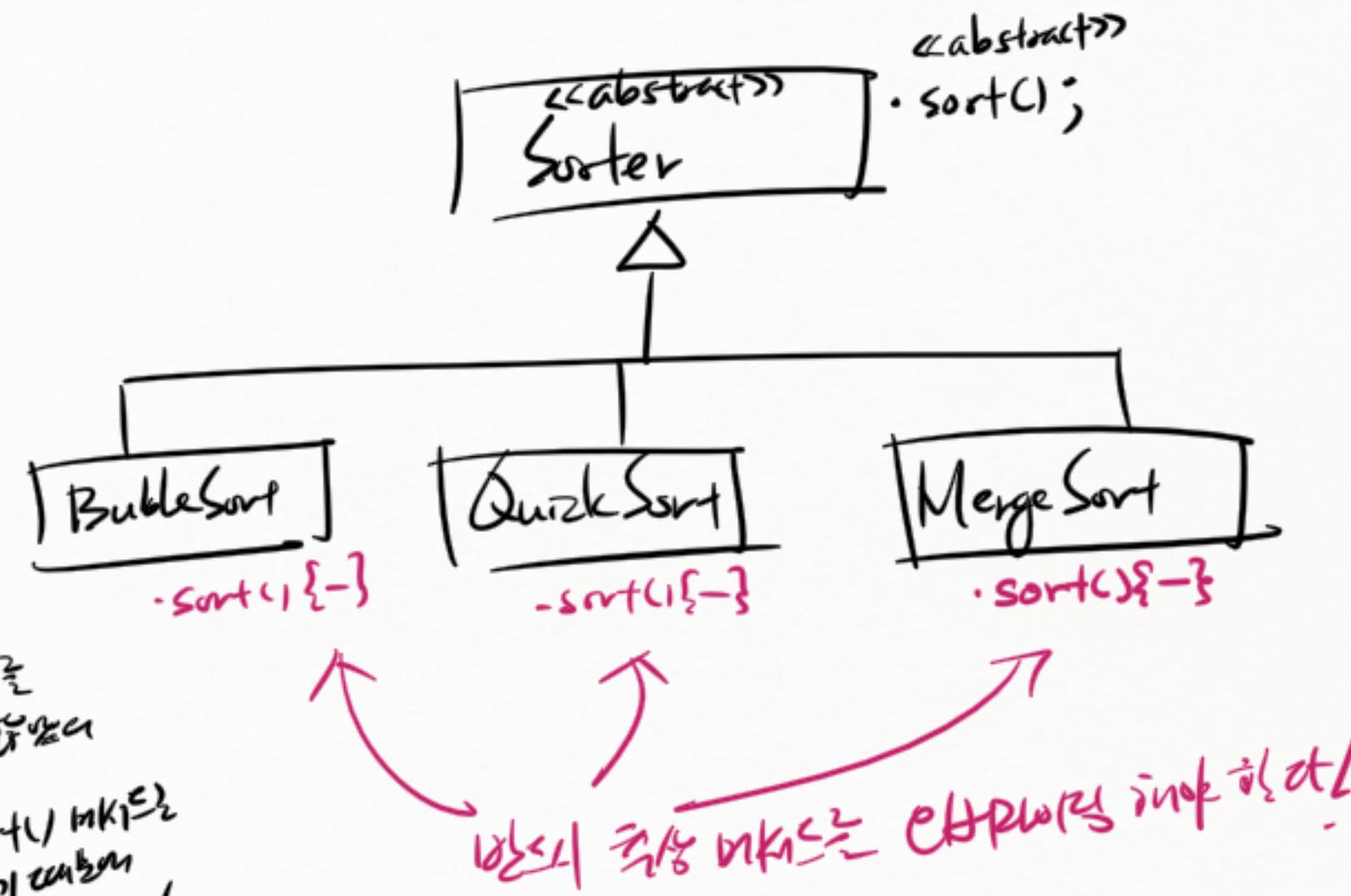
}

* 추상클래스와 추상메서드의 활용

③ 추상클래스로 추상클래스로 나누기

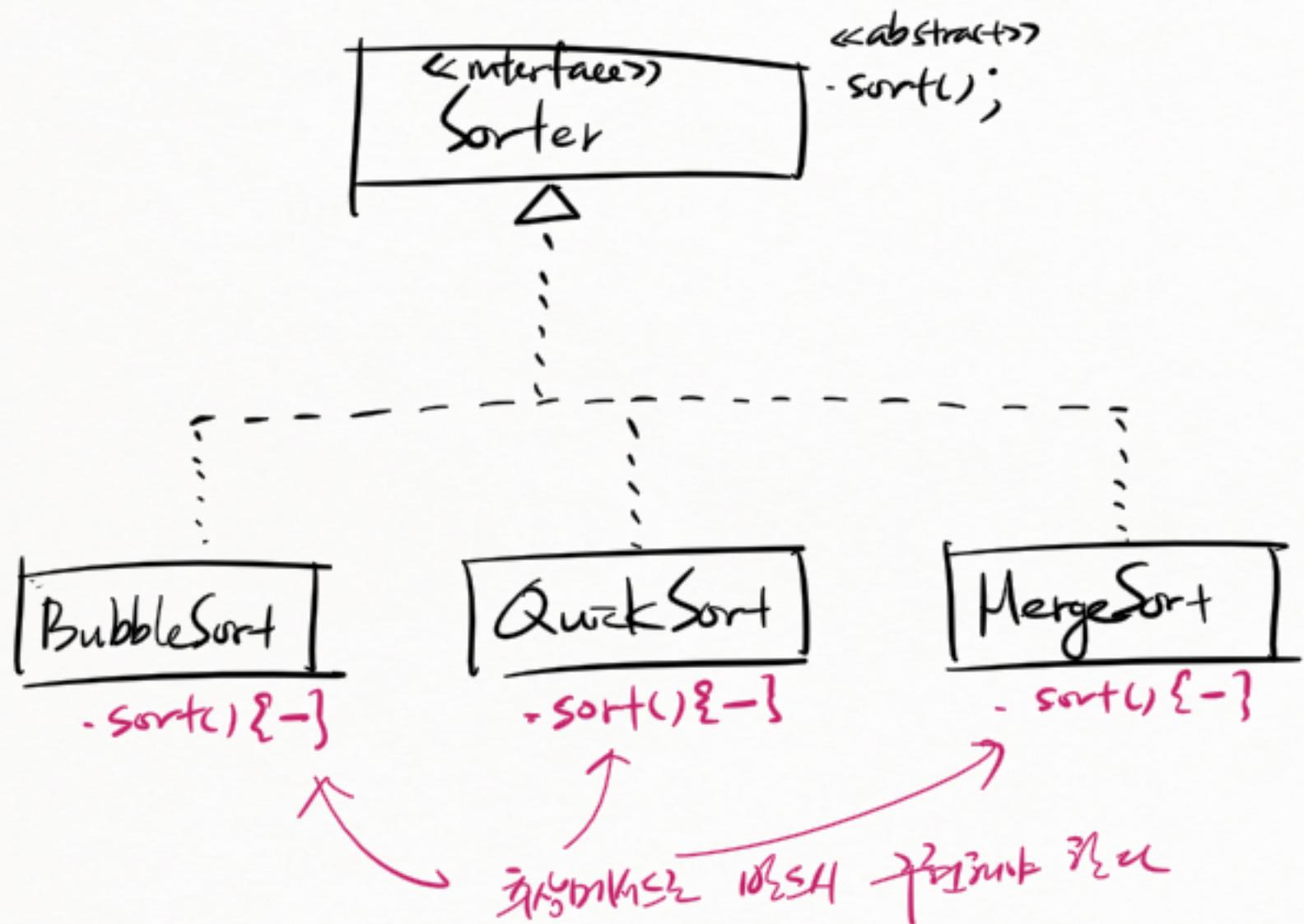


④ 추상메서드로 분리하는 것

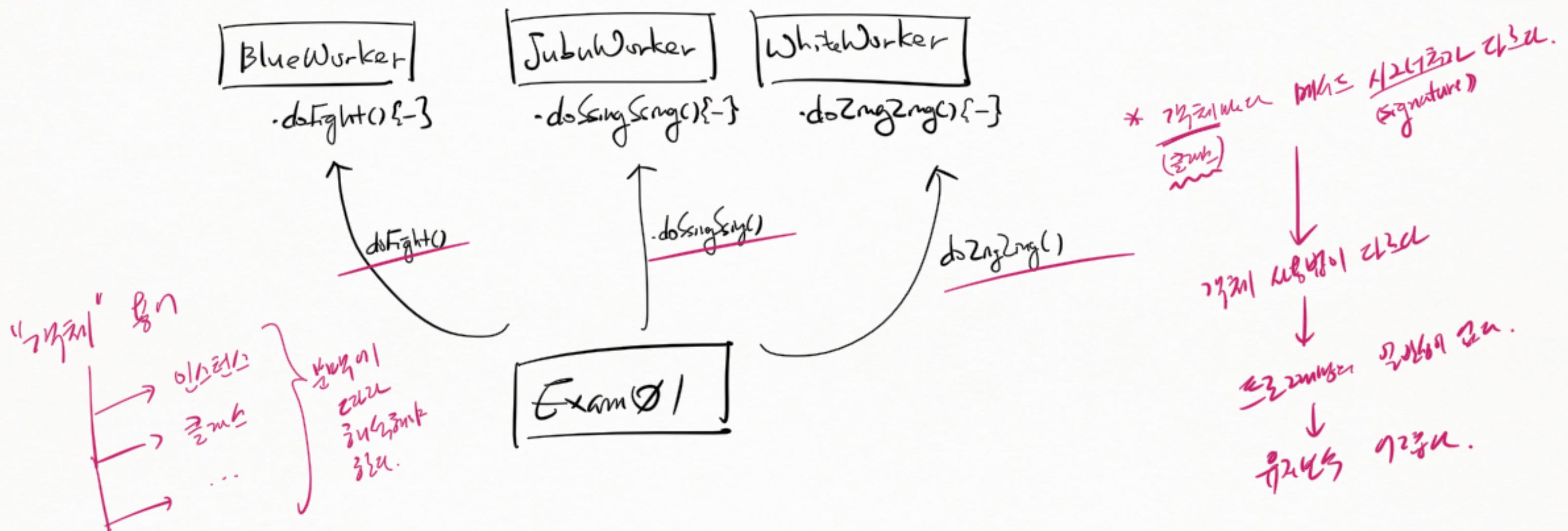


* 추상클래스 만든 인터페이스를 끌 때

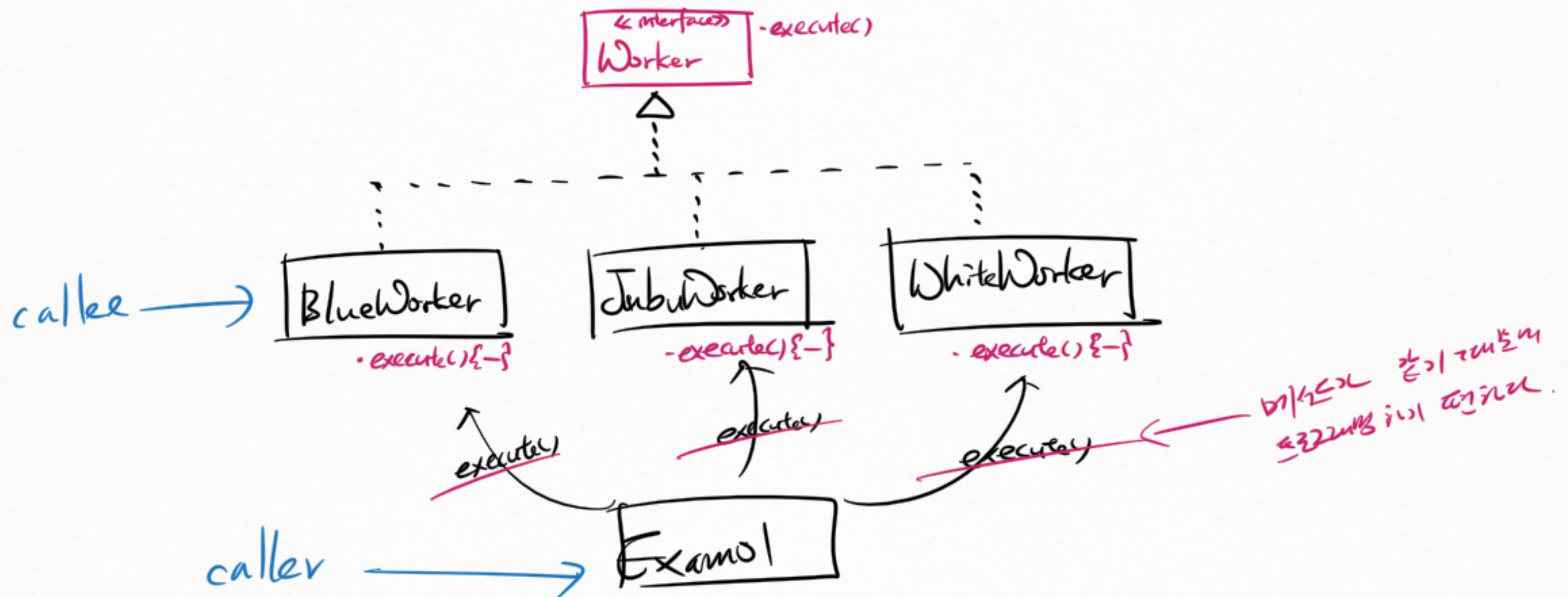
⑤ 추상클래스 만든 인터페이스로 만들기



* 인터페이스 사용 : - oop. ex9. al. before



* 인터페이스 Abstraction : - oop. ex9. al. after

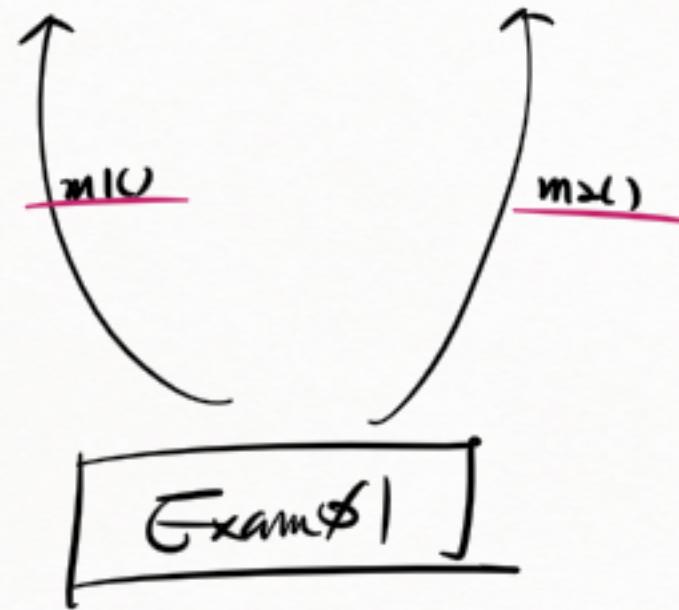
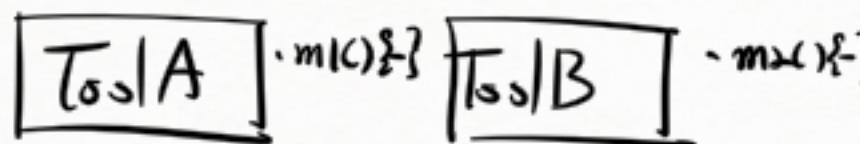


* 인터페이스 사용 전 / 후

① 사용전

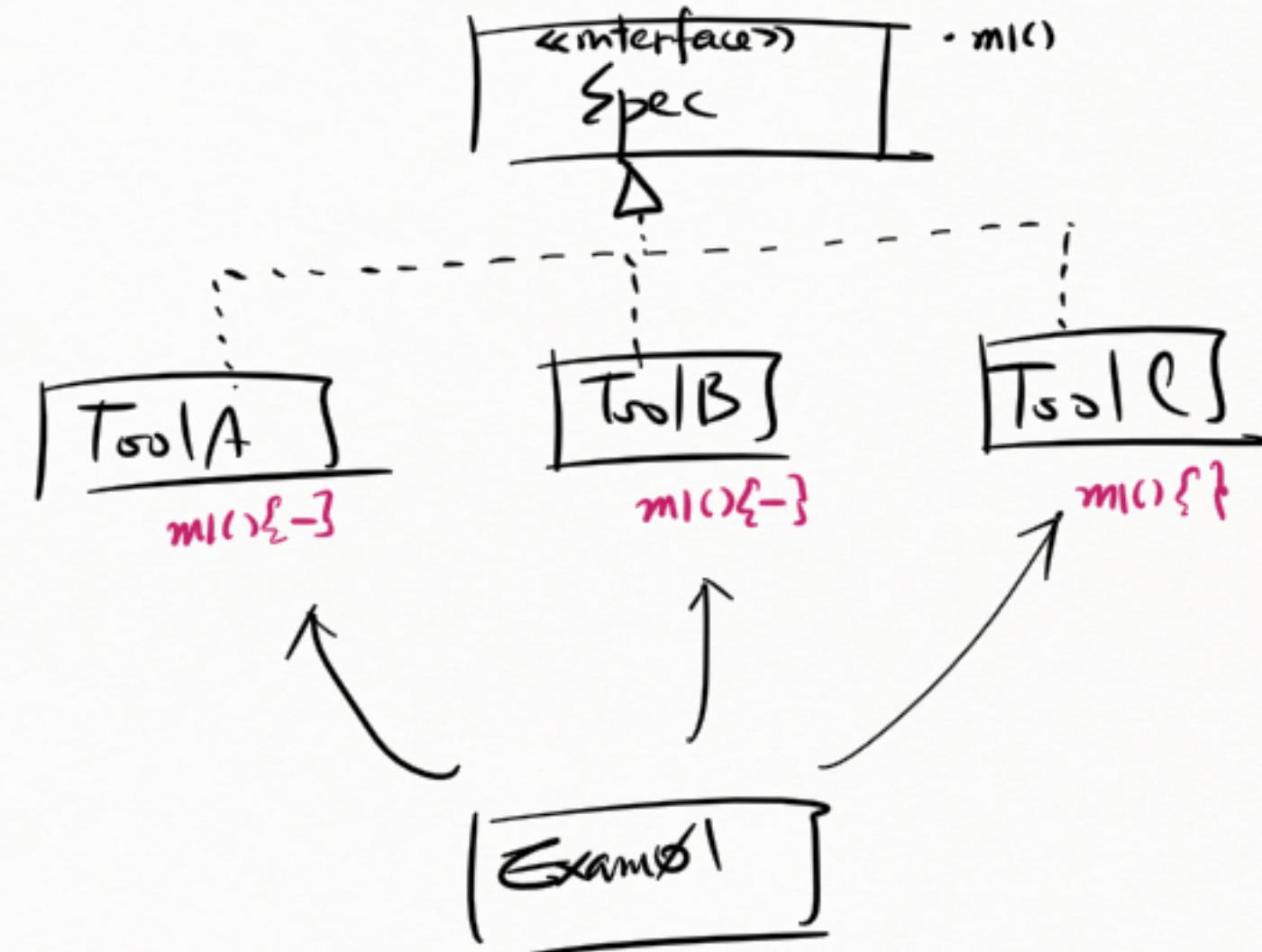
개선

② 사용 후

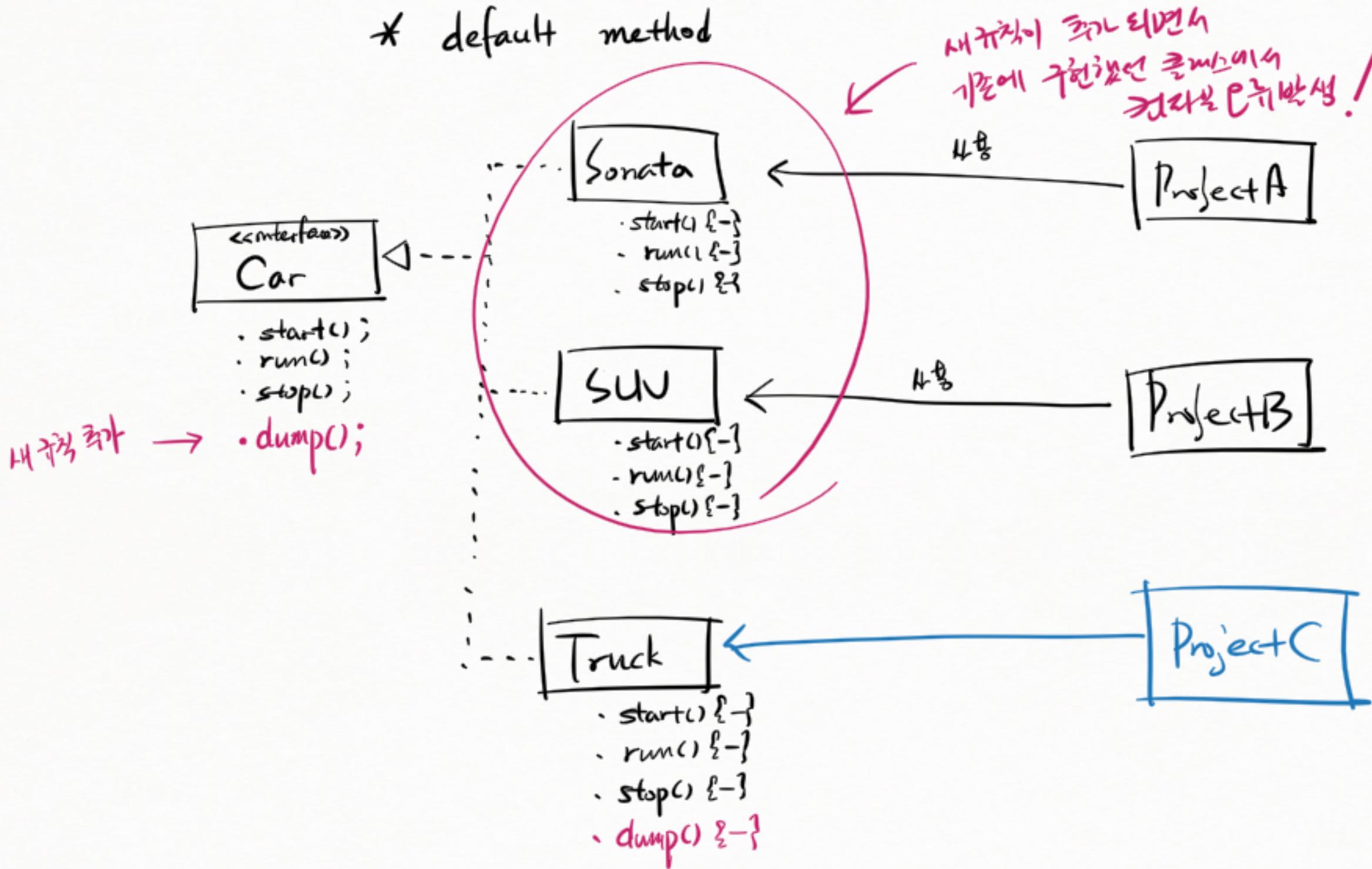


단점
m1(), m2()가 두 클래스에 모두 포함되어 있어 관리가 번거롭다.

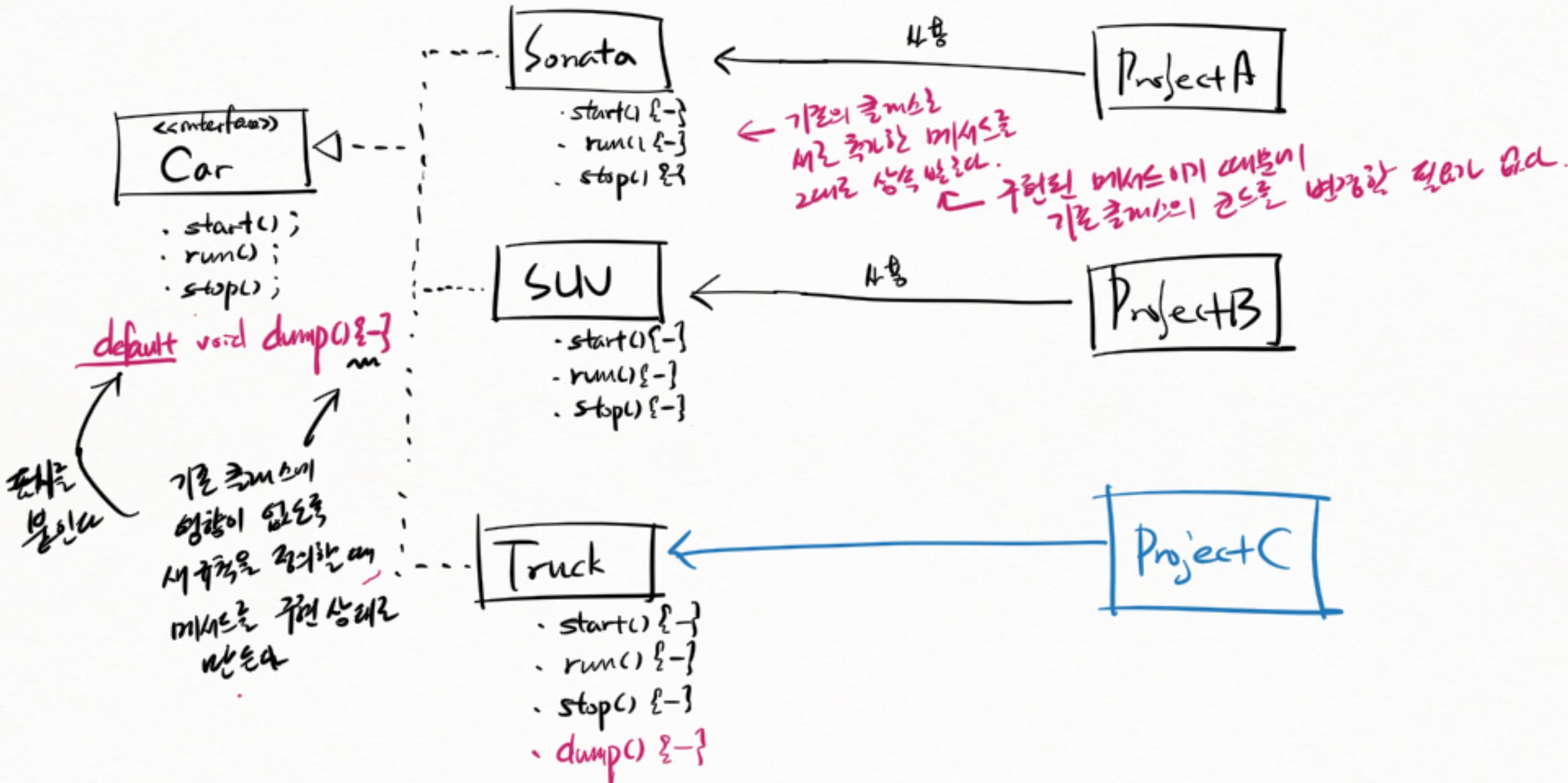
제거
단점
유저에게는 두 가지 서비스가 있는 것처럼 보인다.



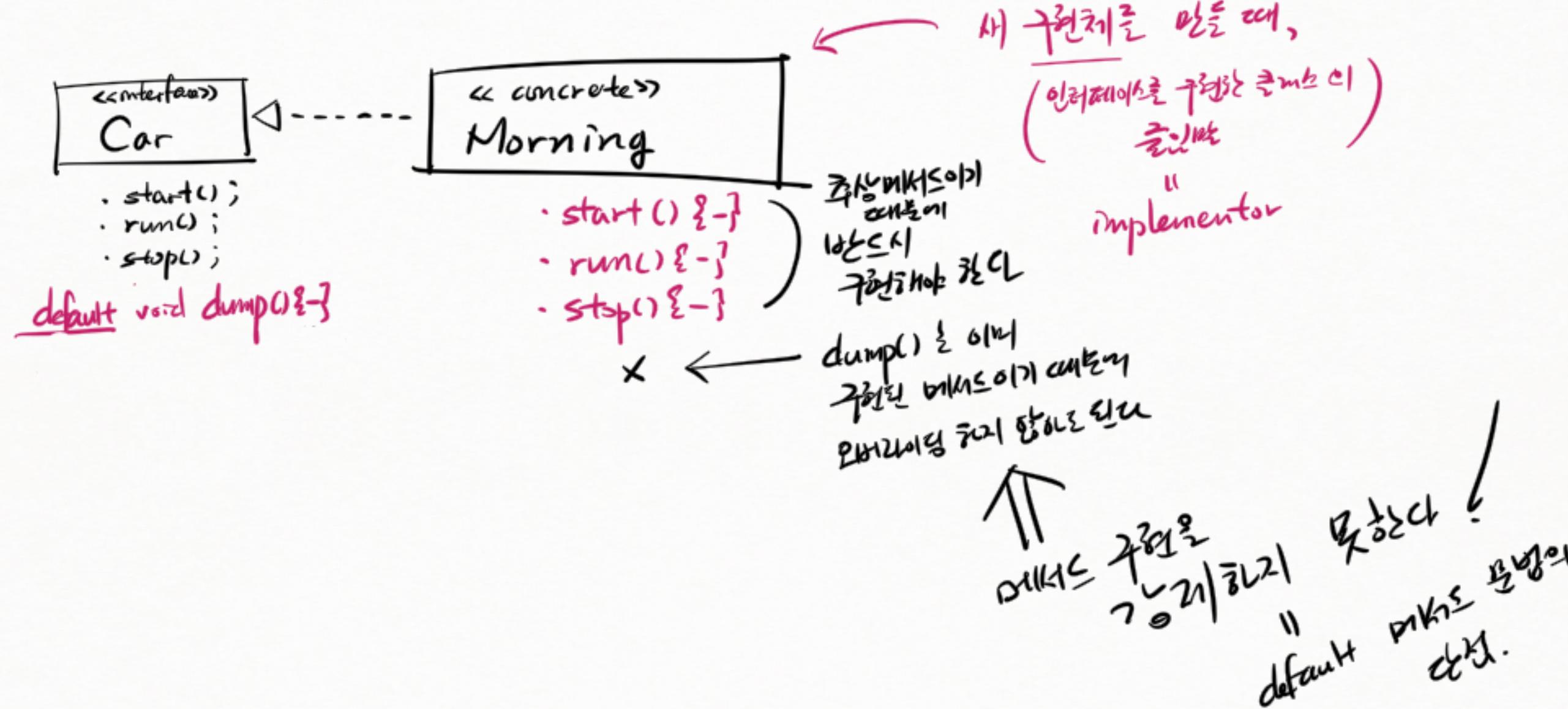
* default method



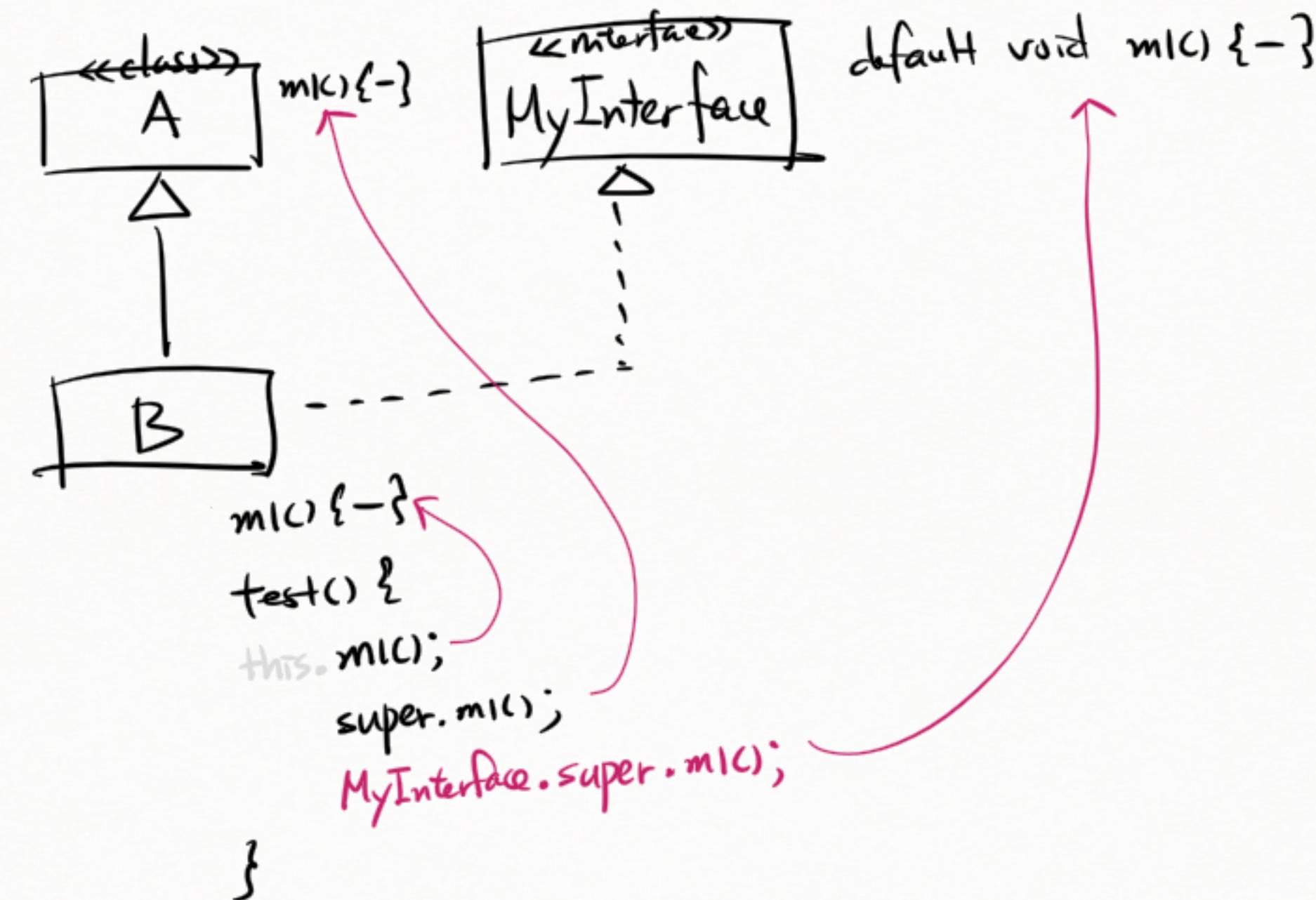
* default method ← 기존의 구현 클래스의 상황을 유지하면서
새 규칙을 추가하고 싶을 때,



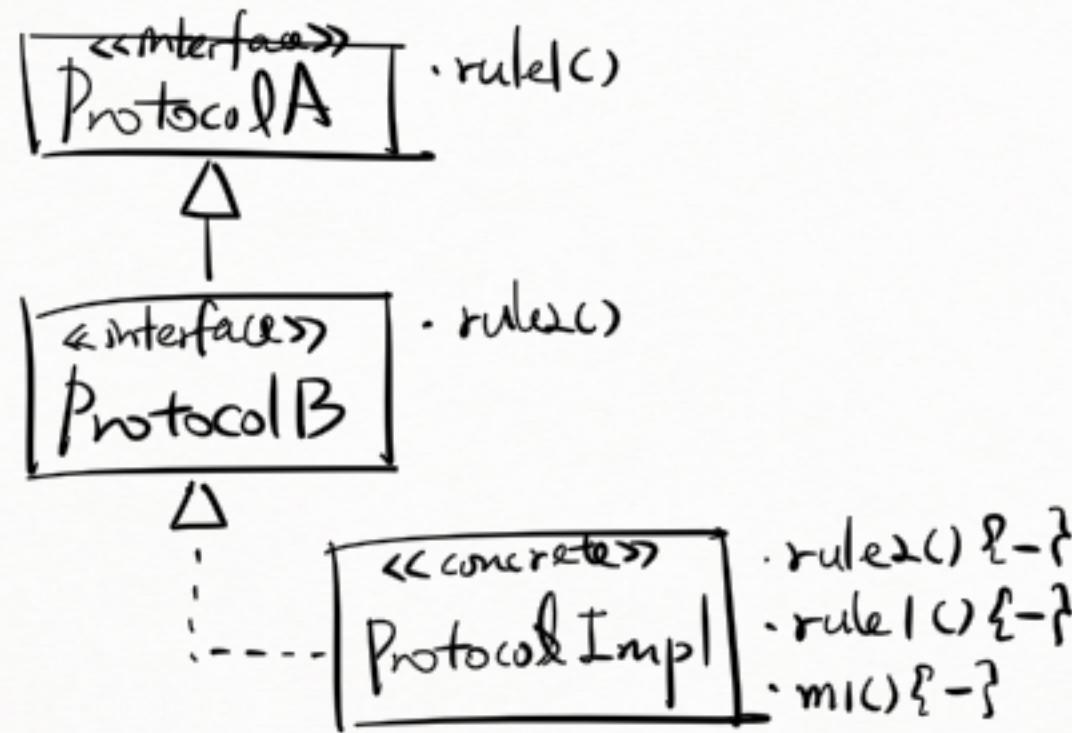
* default method of Σ



* super el. 인터페이스.super



* 인터페이스 상속 - oop.ex09.c.*

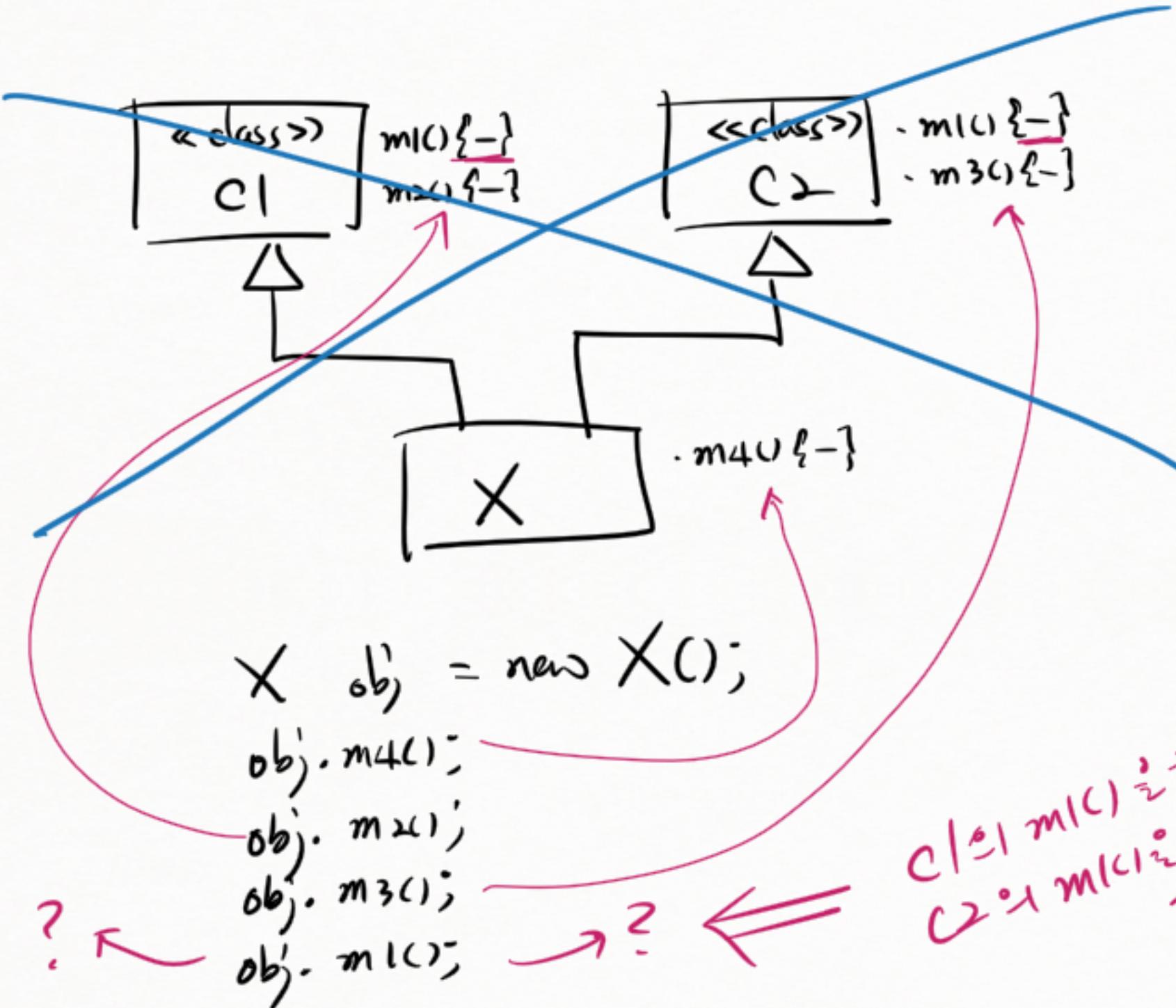


ProtocolImpl obj = new ProtocolImpl();
obj.m1(); // ok
obj.rule2(); // ok
obj.rule1(); // ok

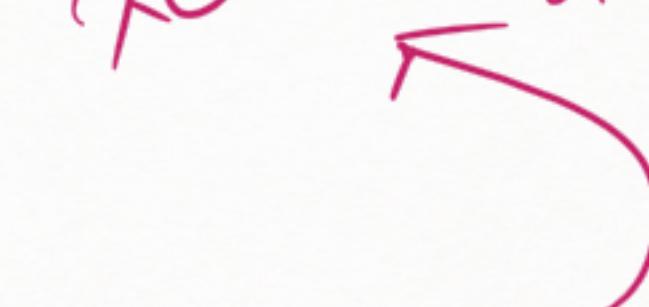
ProtocolB b = obj;
b.m1(); // error
b.rule2(); // ok
b.rule1(); // ok

ProtocolA a = obj;
m1(); // error
rule2(); // error
rule1(); // ok

* ~~클래스~~ 다음 상속과 인터페이스 다음 상속

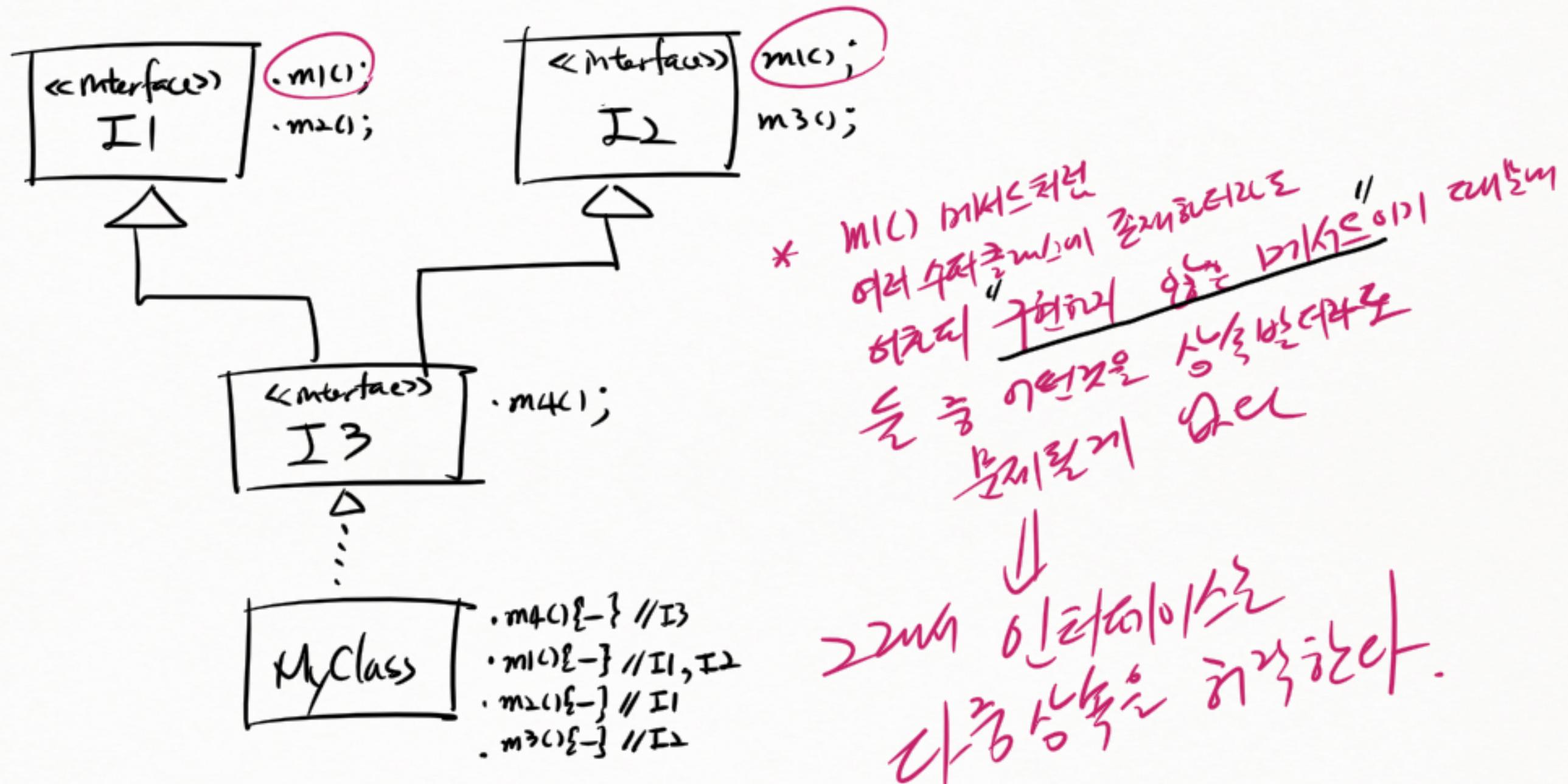


2차원
2차원
2차원
2차원

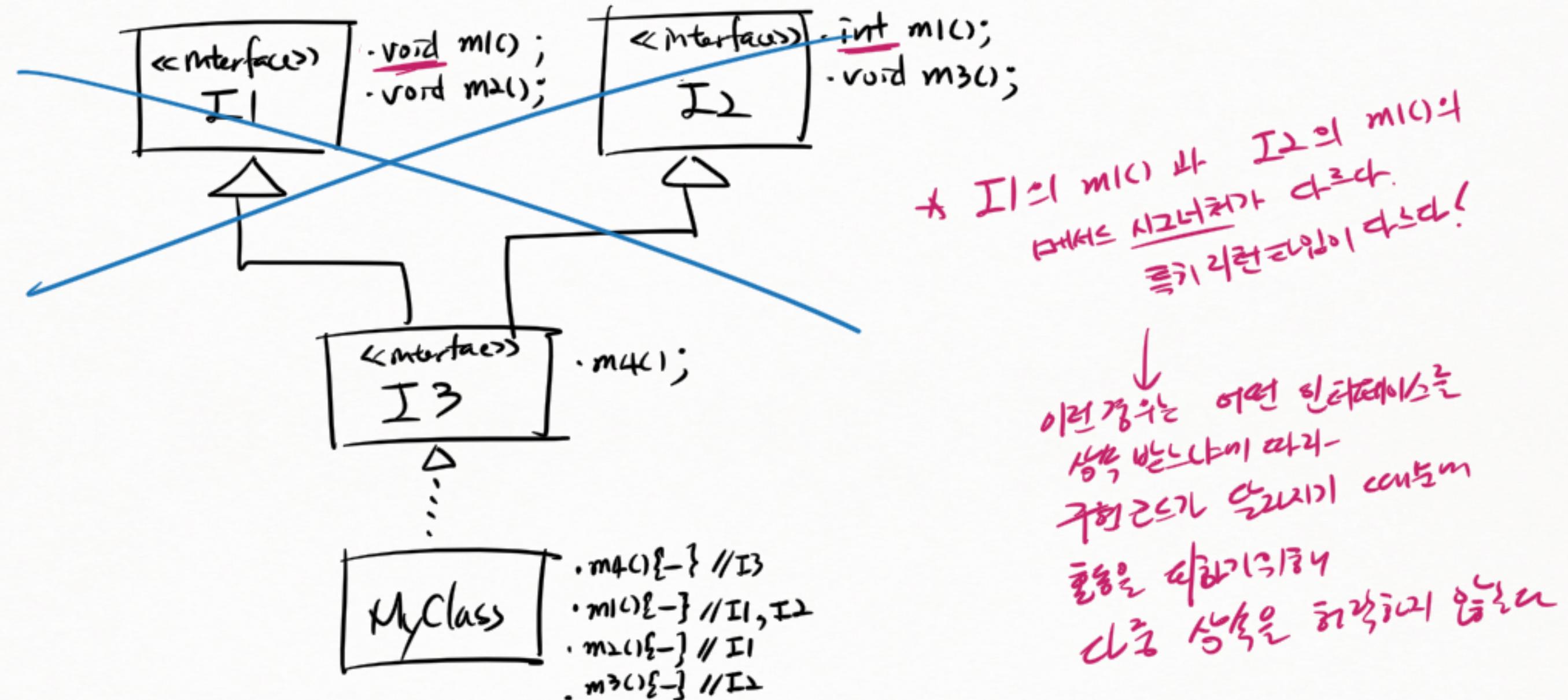


CH:
m1()은 구현된
m1()인 클래스가 어떤가

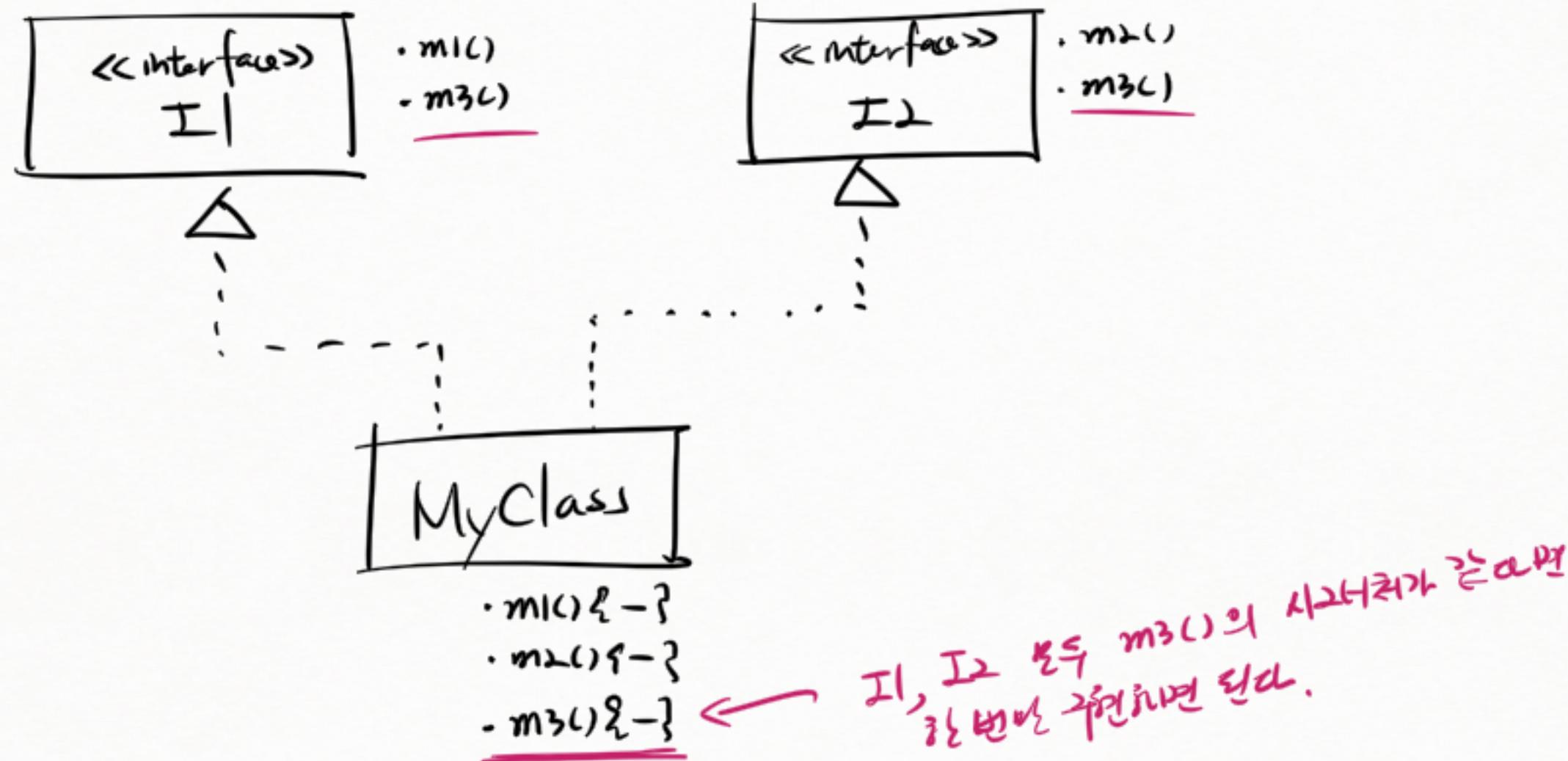
* $\frac{1}{2}$ m1 다중 상속과 인터페이스 다중상속



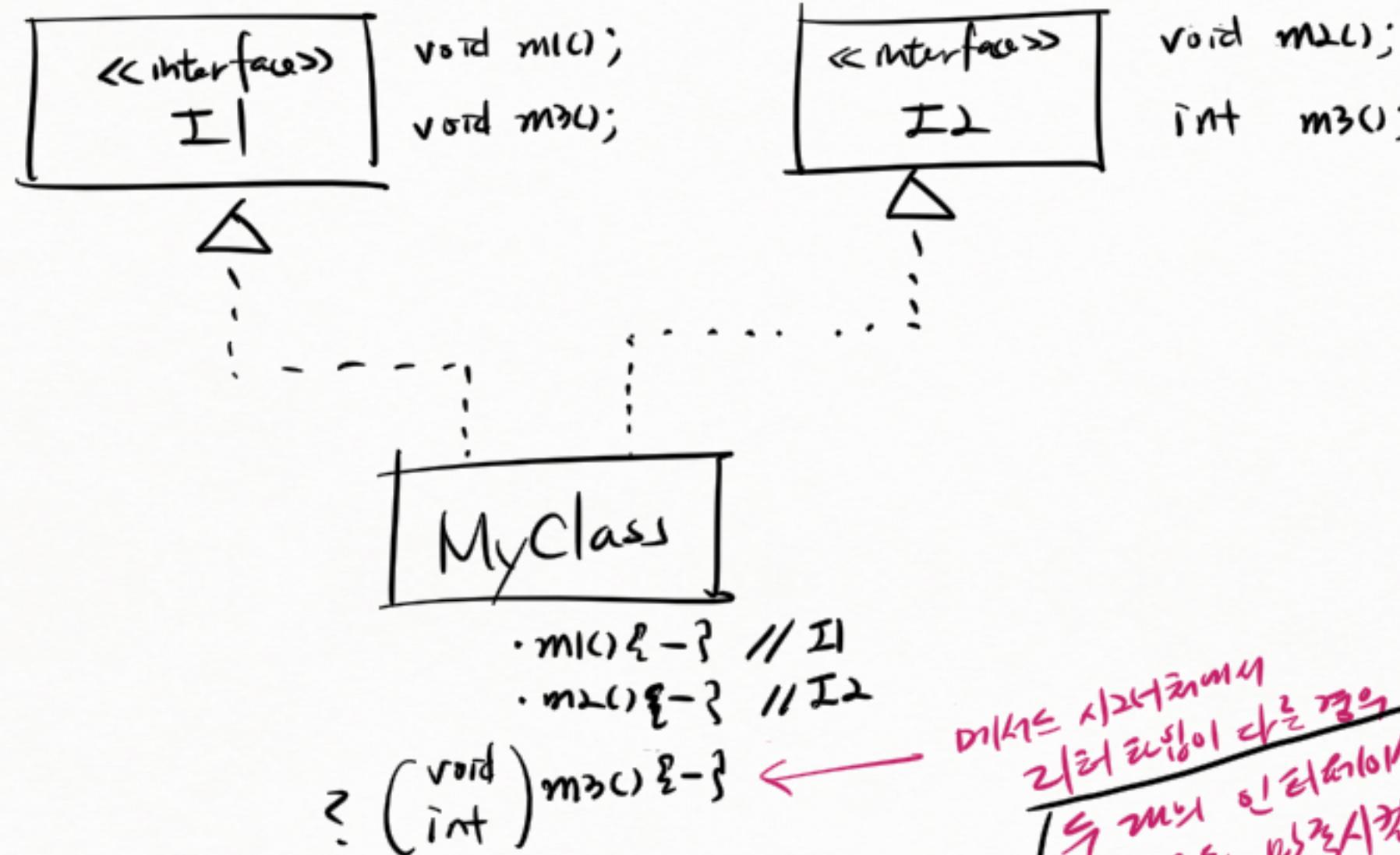
* 인터페이스 다중 상속 불가!



* 인터페이스의 상속 특성

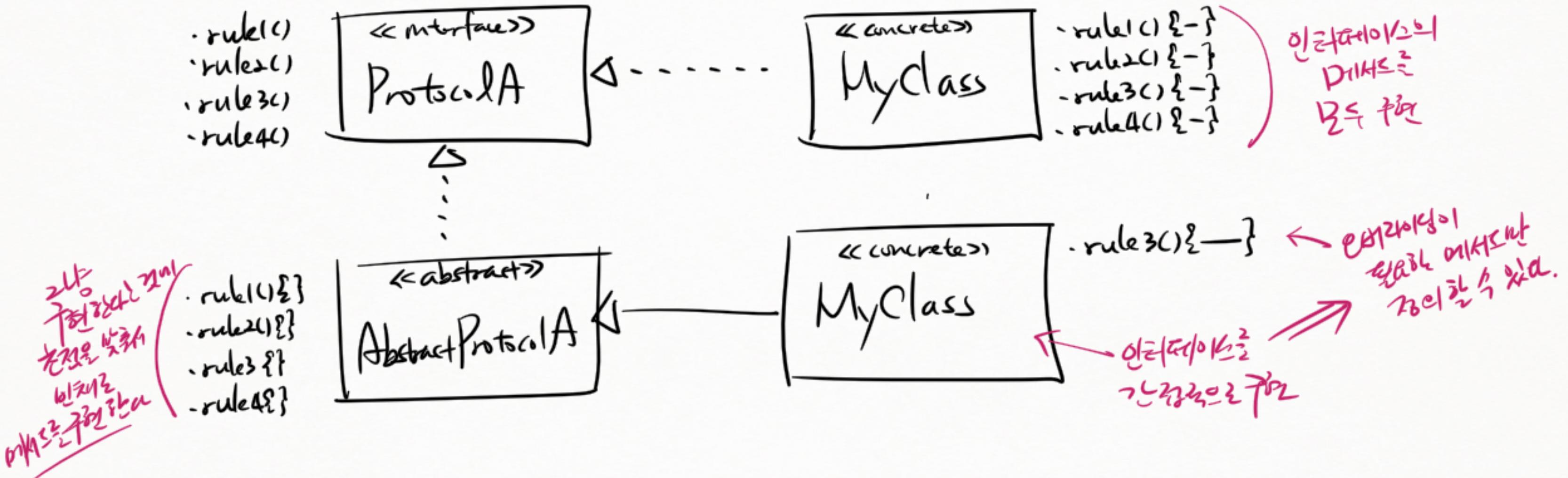


* 인터페이스는 다형성을 위한!

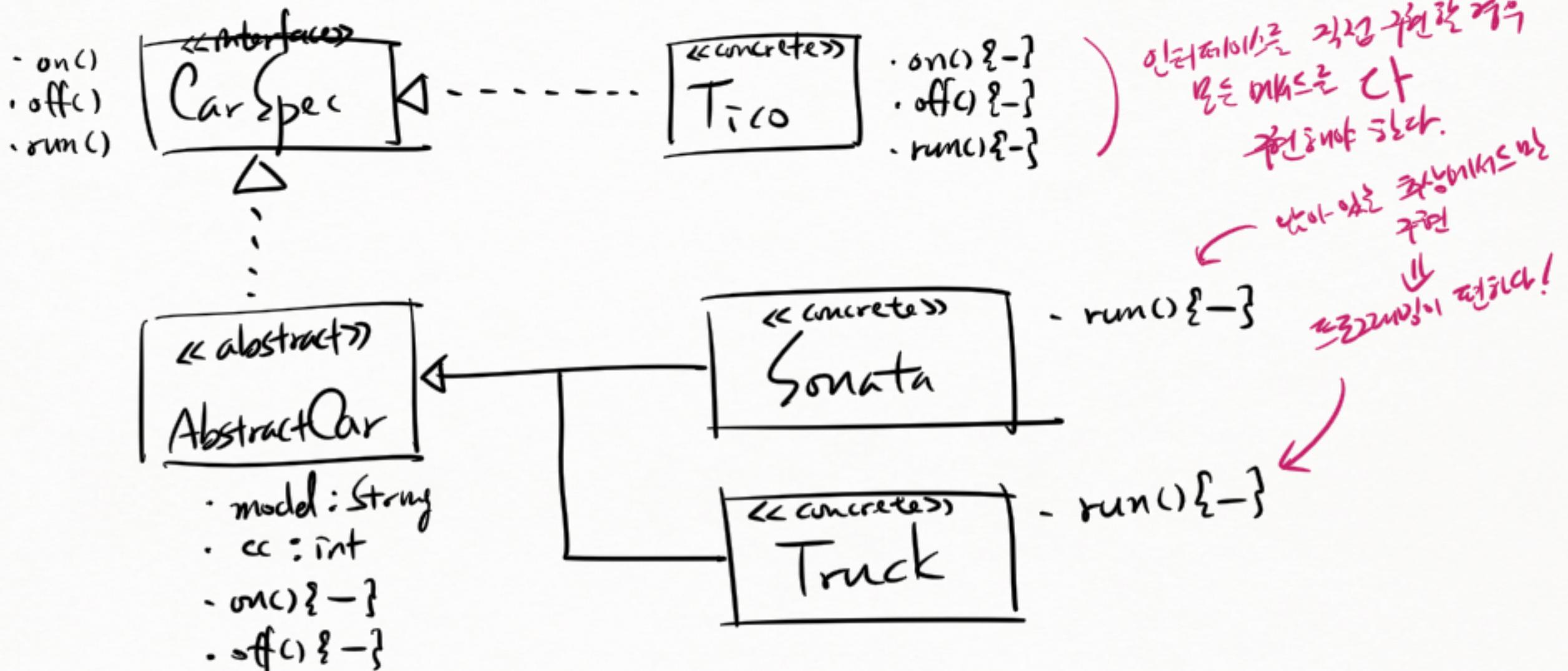


MyClass는 시그니처만 있어
구현하는 것이 다른 경우의
수도 있는 인터페이스 구조
를 두는 만족사적인 풀이!
=> 너무 다형성을 위한!

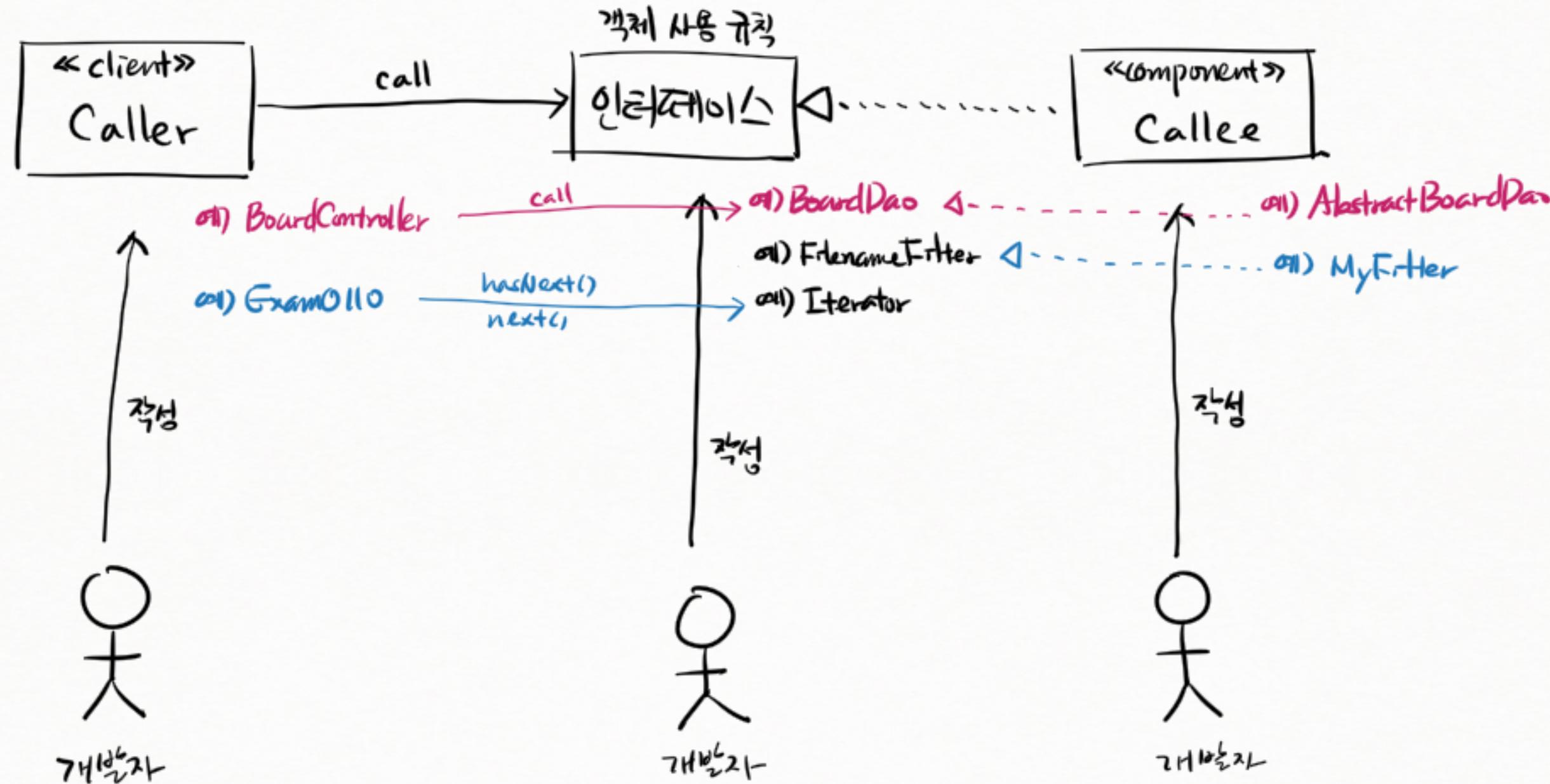
* 인터페이스와 추상 클래스의 혼란



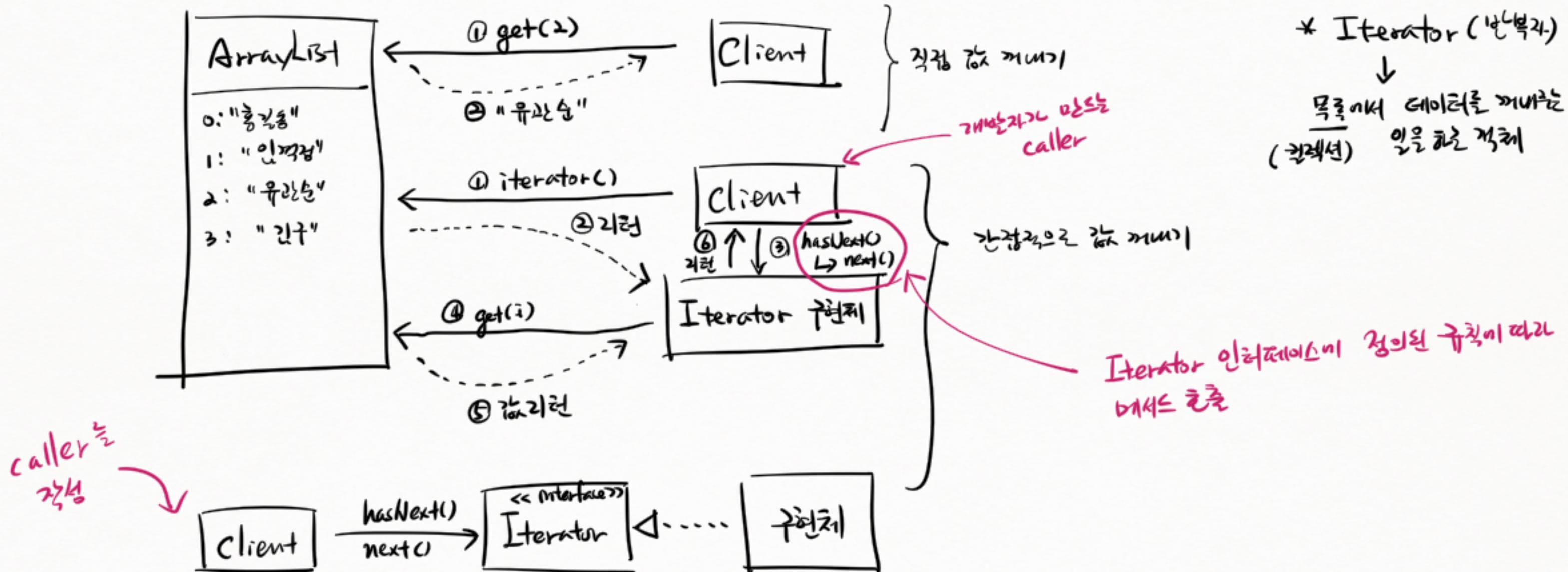
* 인터페이스와 추상클래스 활용 예)



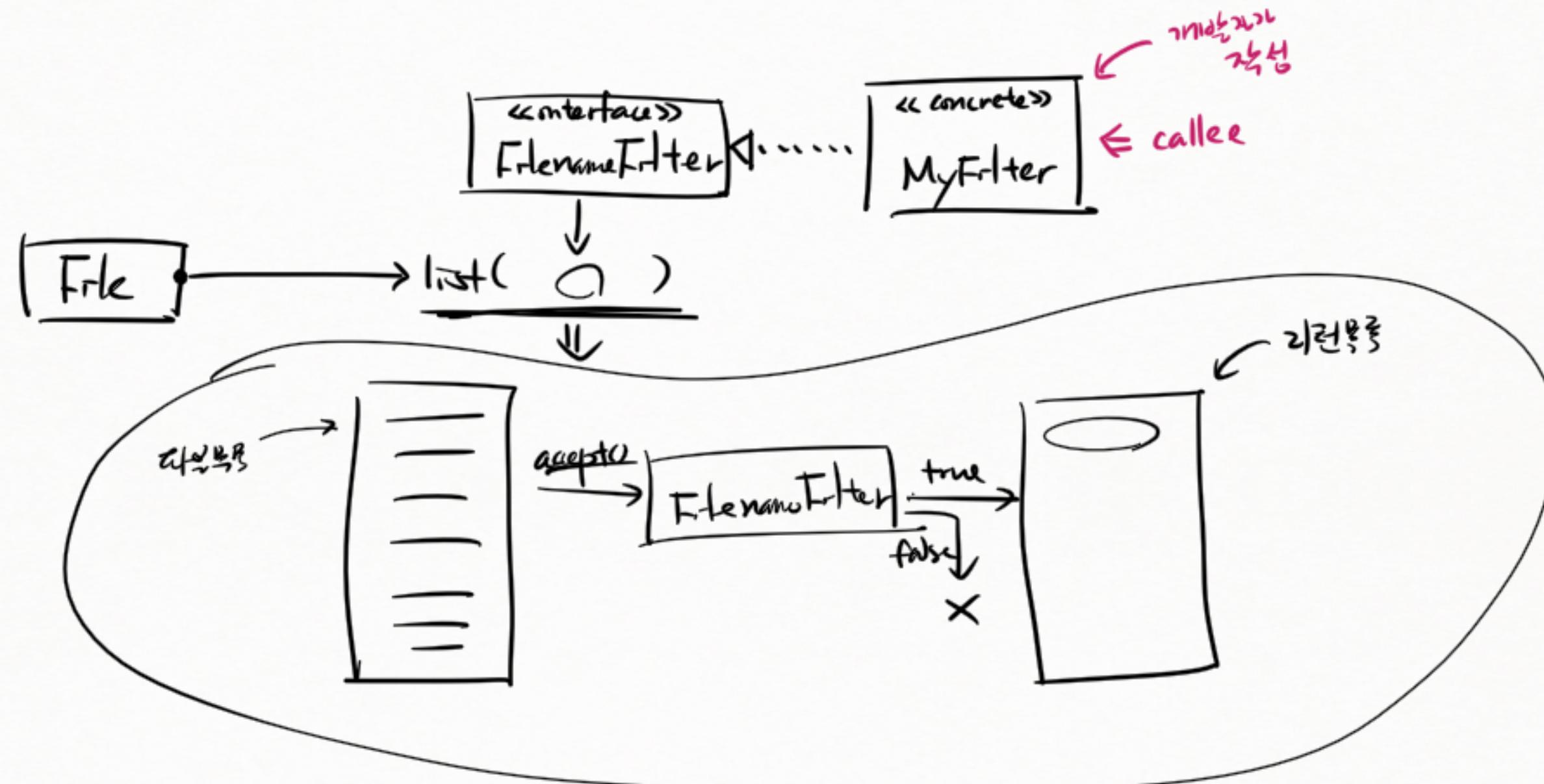
* 인터페이스와 구현체



* Caller 개발 입장



* callee 2 번째 괄호

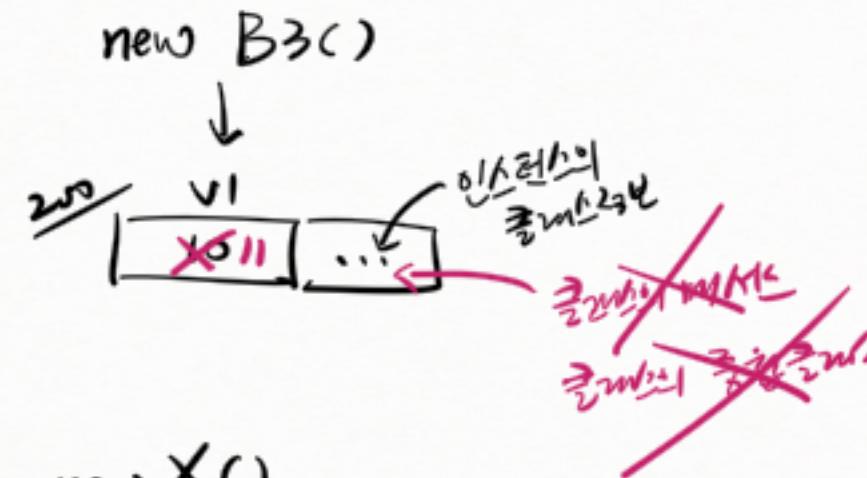


* inner 클래스의this
(com.romcs. oop. ex1. c. Exam0230)

B3 outer = new B3()

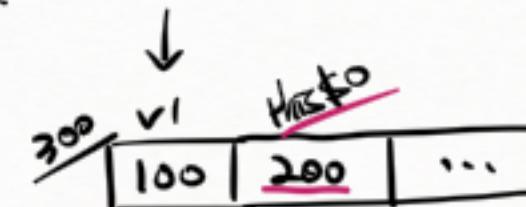
outer

200



B3.X x1 = outer.new X()

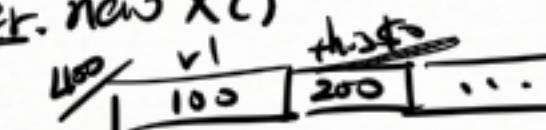
x1
300



x1.test()

B3.X x2 = outer.new X()

400



Method Area

void test()
this = 300
v1 = 1000

출23: v1 → 1000

출23: this.v1 → 100
300

출23: B3.this.v1 → 11
↓
this →
100

B3 outer2 = new B3()

outer2
500

v1
x22
...

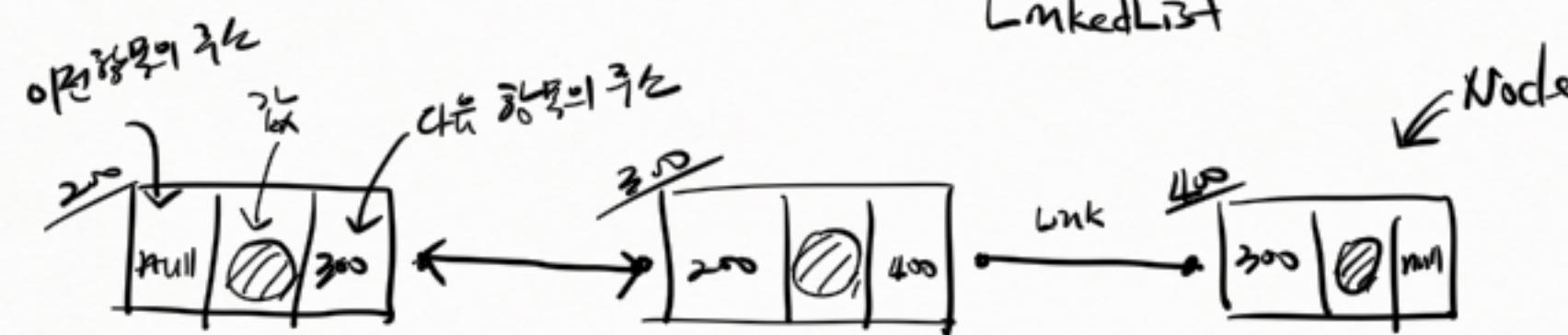
B3.X x3 = outer2.new X()

x3
600

v1
this
...

}

* Linked List



head 200

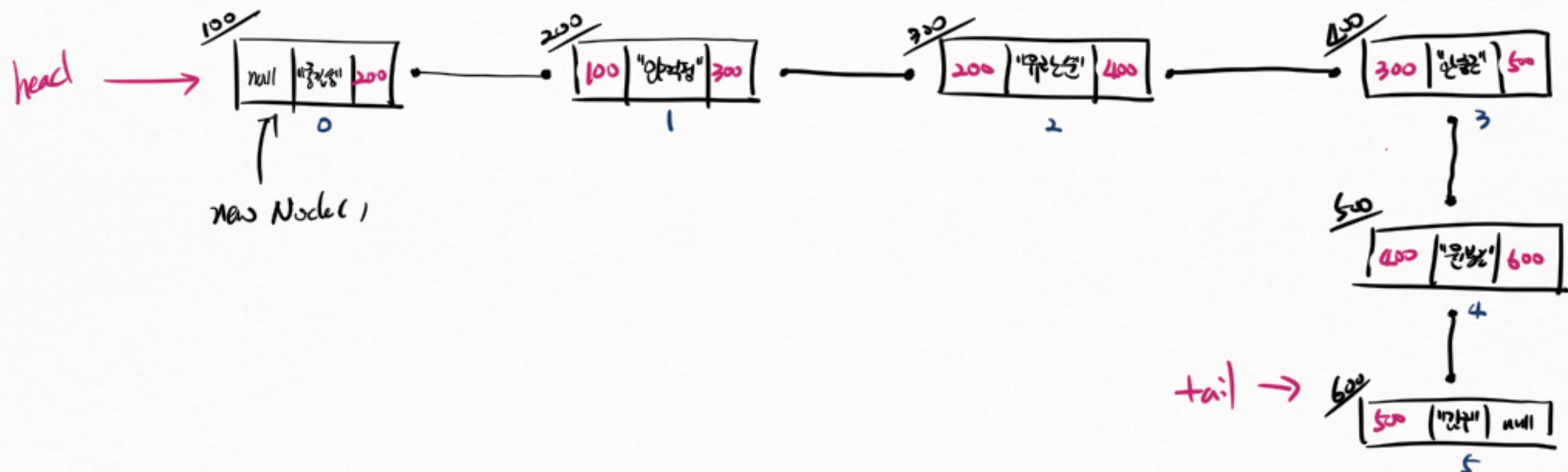
tail 400

* LinkedList - 鏡像串

head [100]

tail [600]

size [1]

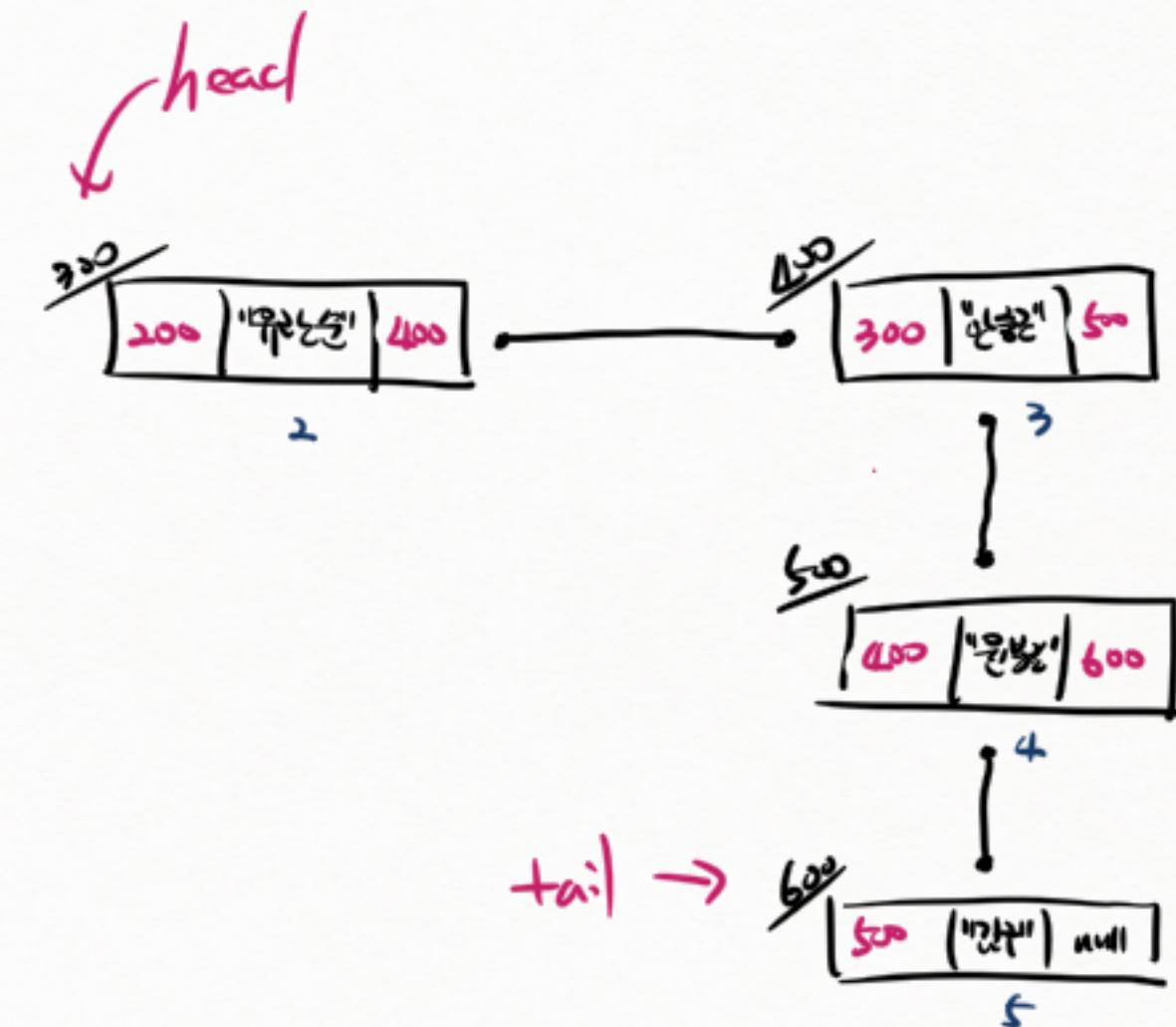
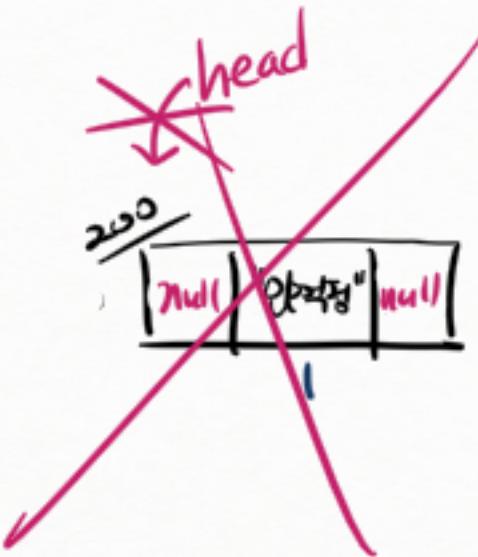
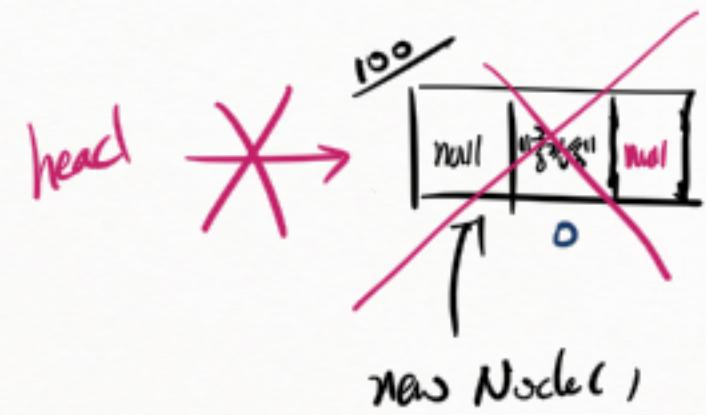


* LinkedList - 2번 삭제 (맨 끝 값)

head [300]

tail [600]

size [1]



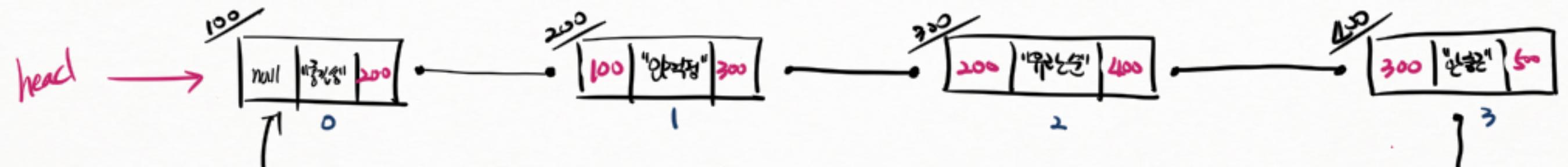
}
 remove(0);
 remove(0);

* LinkedList - ဇုန် လုပ် (မြင် လိပ်)

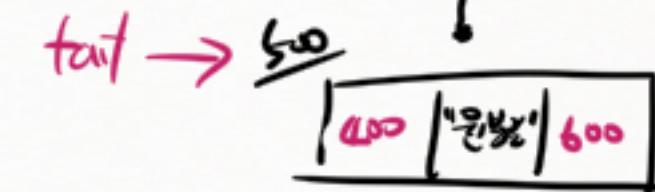
head [100]

tail [500]

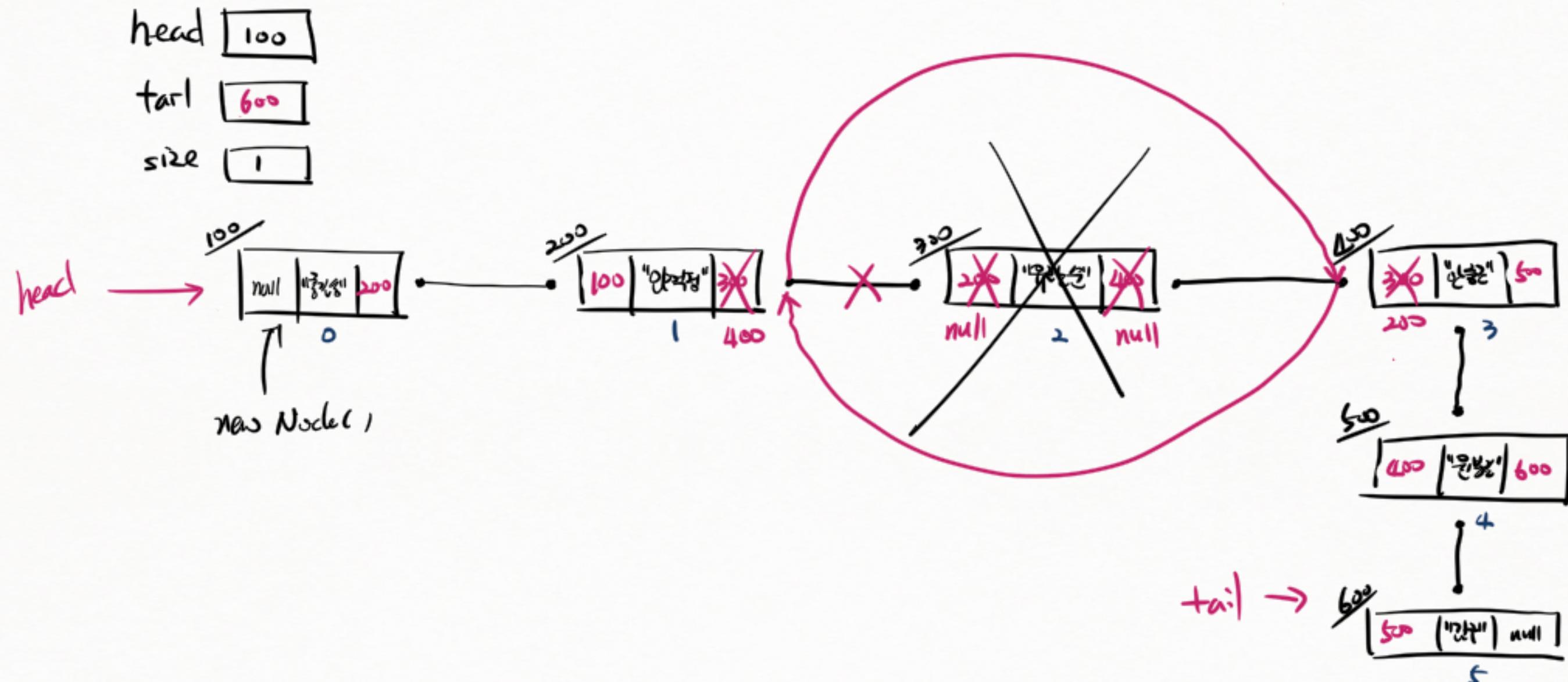
size [1]



`new Node(1)`



* LinkedList - یۆر اەلەدە (ىچىلىق ئۆز)

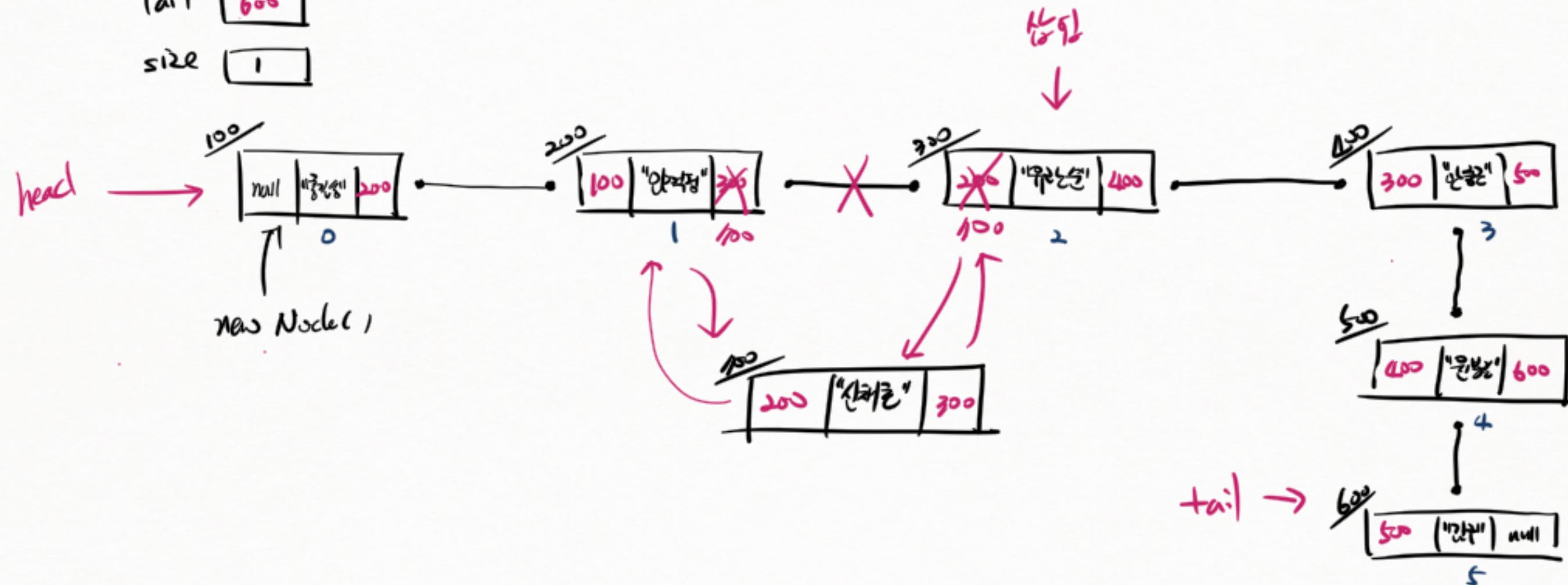


* LinkerList - 7.6.1601

head 100

tarl | 600

size

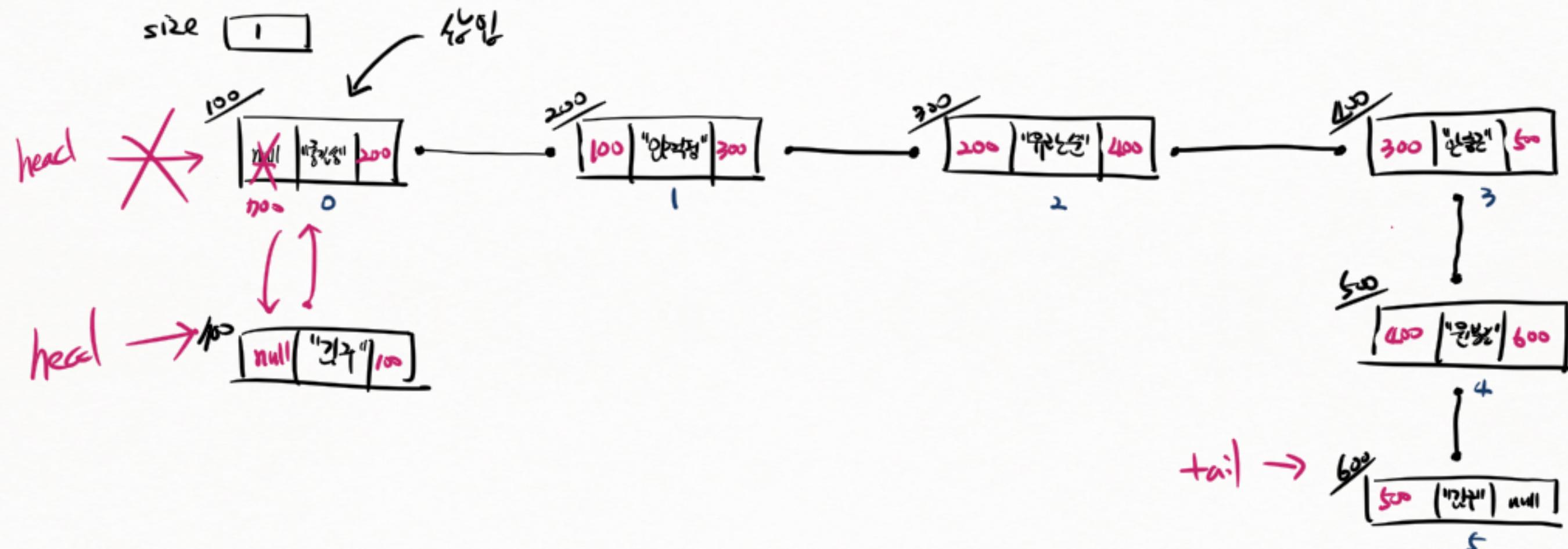


* LinkedList - 빙고 틀 (반복)

head 100 100

tarl 600

size

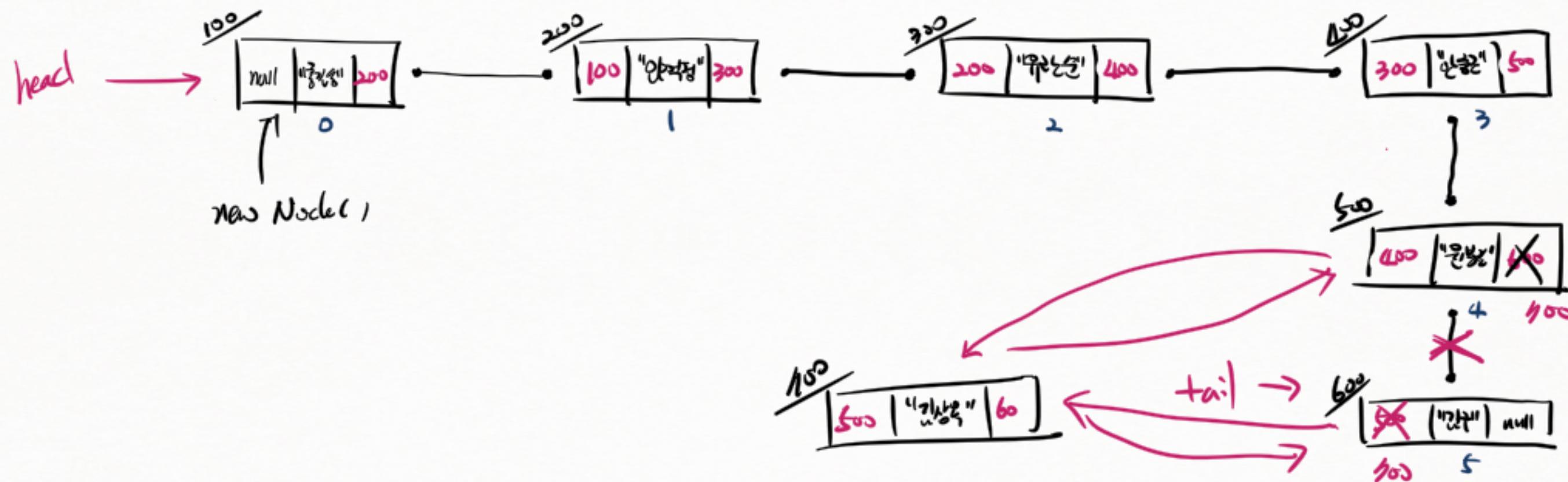


* LinkedList - ဇုန်လွှာ (DL ၏)

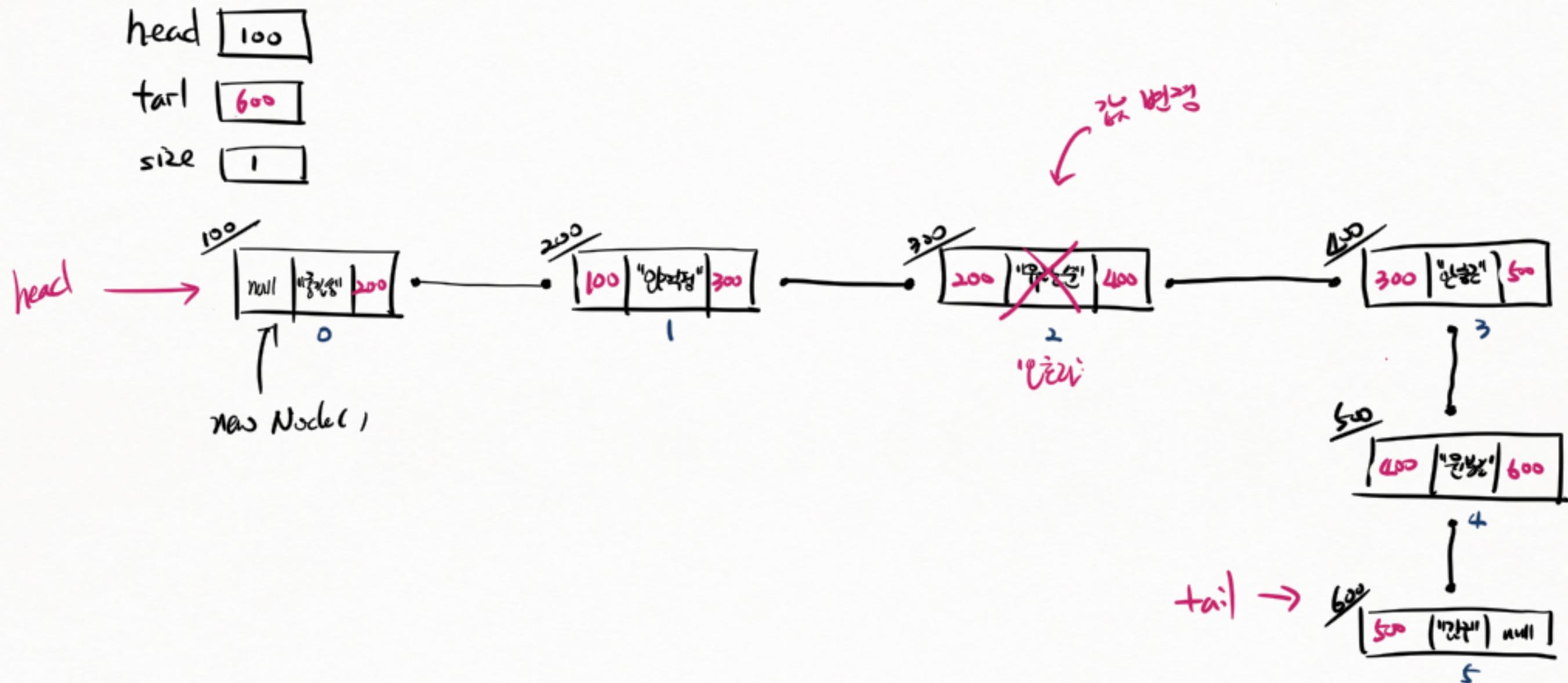
head [100]

tail [600]

size [1]



* LinkedList - 끝 추가



head 100

tail ~~100~~
200

