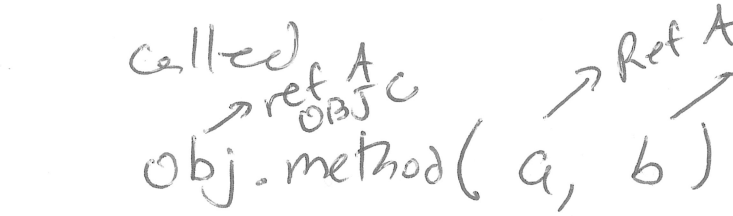
COP 3330 3/12/26

Continue Polymorphism

Rule for figuring out what method gets called



Step 1 - look in the reference class of this (object method was called on)
In example above, it's A.
We will look to see if a method exists in A that takes in an A and B (references).

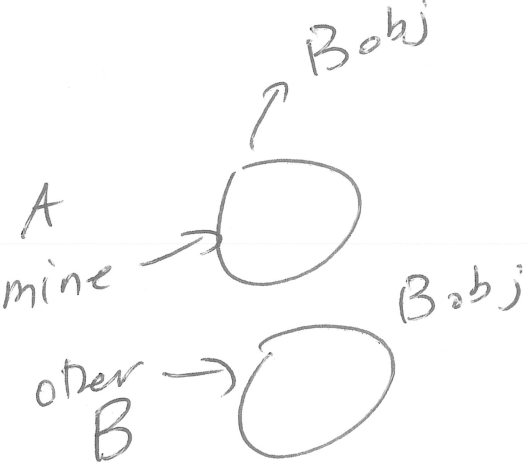
[Job of this step is to determine if the code compiles]

→ if this doesn't exist, we'll look at the class A inherits from, and, all the way down to Object. If no method is found code doesn't COMPILE.

Step 2 - once code compiles, find the method that matches by starting in the OBJECT class of this. find a matching method based on the ~~reference~~ reference types of the parameters.

```
A mine = new B()
B other = new B()

mine.f(other)
```



Why does CODE compile?

reference class of mine is A

go to class A and find a method that takes in a B

matching method WAS

f(A x) in class A

because a B IS-A A.

When finding a method at runtime, since mine is OBJECT B, we look in class B for a method with signature f(A x) because that's what allowed compilation.

f(B x) in B DOESN'T MATCH

So we look to class A.

Modifications

1) Add a method to B:

f(A x), prediction → this will get CALLED in class B (match found!) ✓

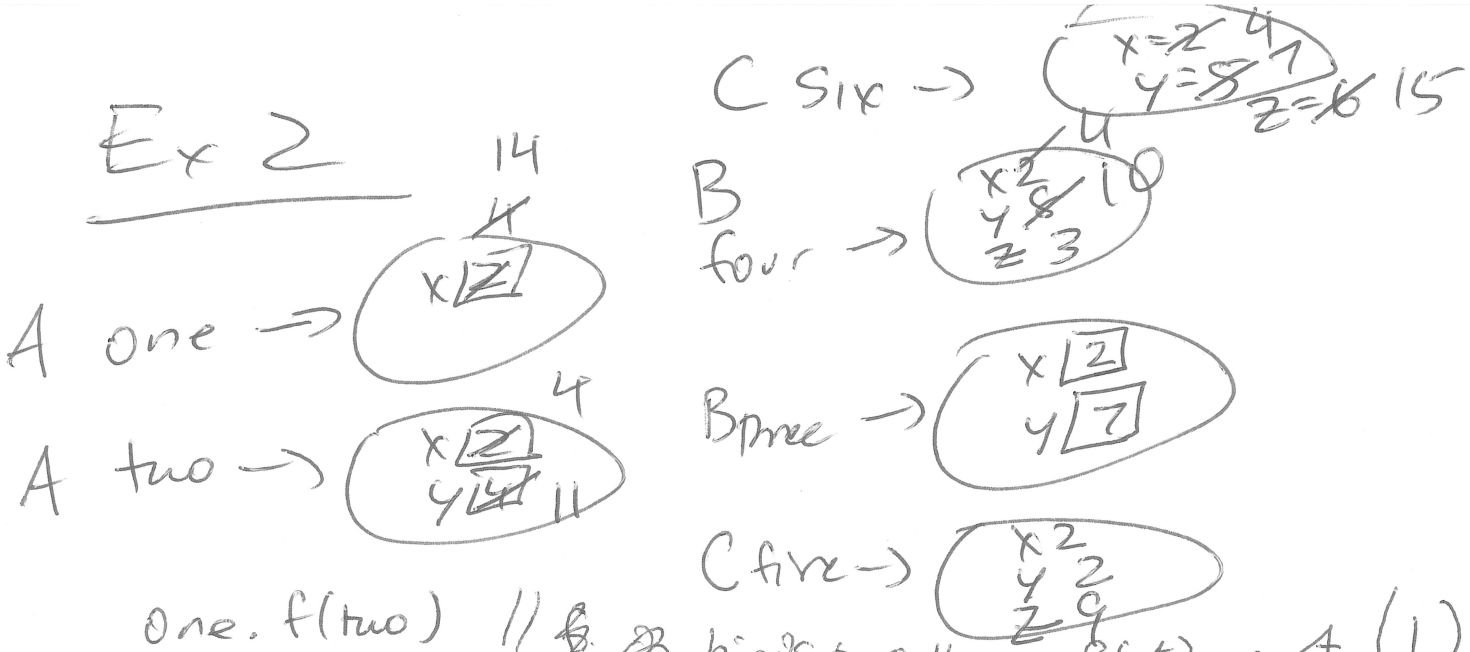
2) Remove #1, Add to A ✓

f(B x) prediction → ONLY f(Bx) in class B will be called

3) Add bob

same action as case 2.

Ex 2



one.f(two) // binds + calls f(A) in A (1)

one.f(four) // my x = 4, your x = 2, your y = 8 (2)
binds + calls f(B) in A

two.f(three) // binds to f(B) in A calls f(B) in B (4)

four.f(five) // bound f(B) → in B none in class C, called in class B (4)

six.f(five) //

after this

five prints as
(2, 8, 9)

six prints as
(4, 7, 15)

six in class C for reference. five is class C for reference ~~but no~~ so match is f(C) in in class C, compiler binds to 6 so this gets called.

prints 3 (4, 29) two.f(one) // binds to f(A) in class A
14 + 4 + 11 is 29 for compilation, CALLS f(A)
so two's (y = 29) in class B (3)

prints 5 (4, 10, 7) four.f(two) // binds to f(A) in class B, for compilation. CALLS f(A) in class C
ADDS 4 to z of four
since OBJECT four is C.