

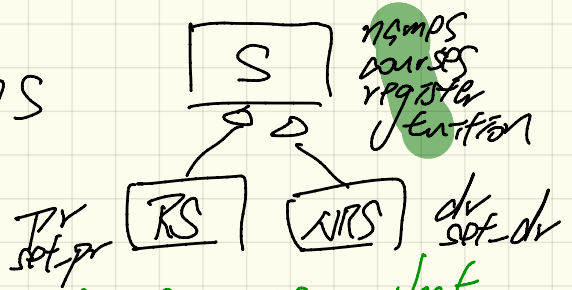
Lecture 11

Wednesday Oct. 18

S: STUDENT

RS: RS

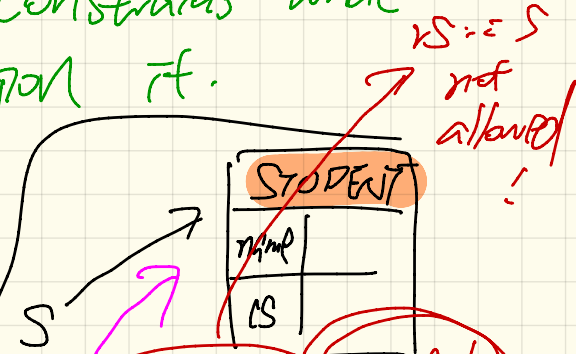
declarations



A variable's declared type constrains what features you can call upon it.

What can we call on S?

S.pr ✓ S.dr X

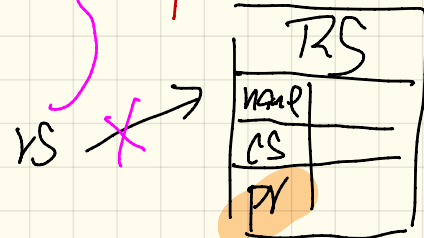


Create {STUDENT} s.make("S")

Create {RS} rs.make("RS")

RS := S X not compile

RS.pr => Crash!



- ① if RS := S was allowed.
- ② We know that RS.pr should be possible

S: STUDENT

rs: RS

nrs: NRS

c: COURSE

declarations

create c. make("3311", 100);
create {RS} rs. make(...);

rs.set_pr(1.25)

rs.register(c)

create {NRS} nrs. make(...);

nrs.set_div(0.75)

nrs.register(c)

S := rs

S.tuition ?

S = nrs

S.tuition ?

rs

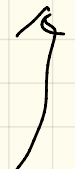
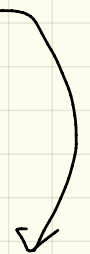
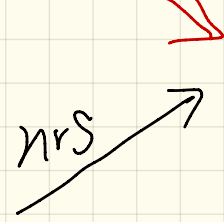
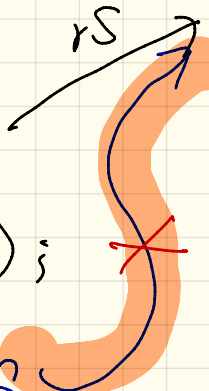
RS	
course	
pr	1.25

COURSE	
f.	3311
f.	100

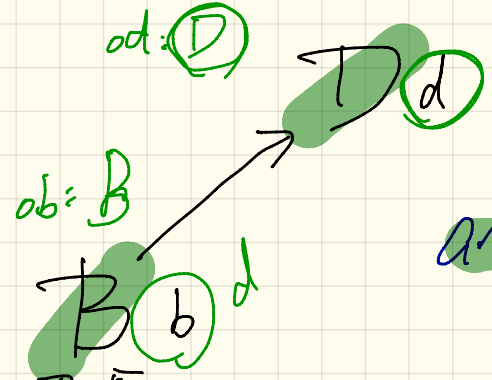
NRS	
course	
div	0.75

nrs

STUDENT S



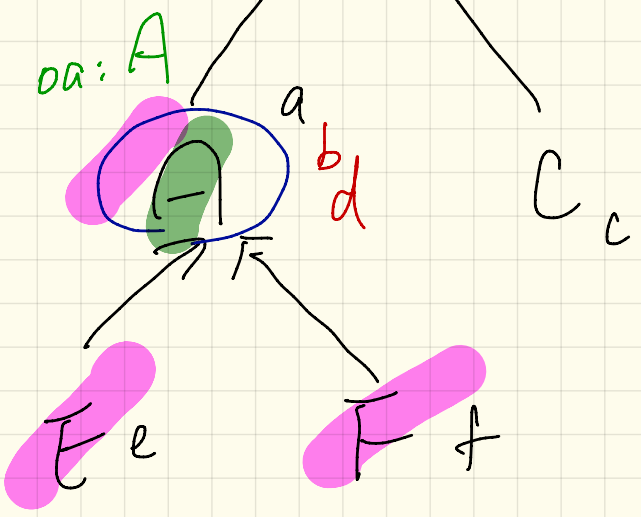
$A \text{ inh. } B$
 $B \text{ inh. } D$
 $\Rightarrow A \text{ inh. } D$



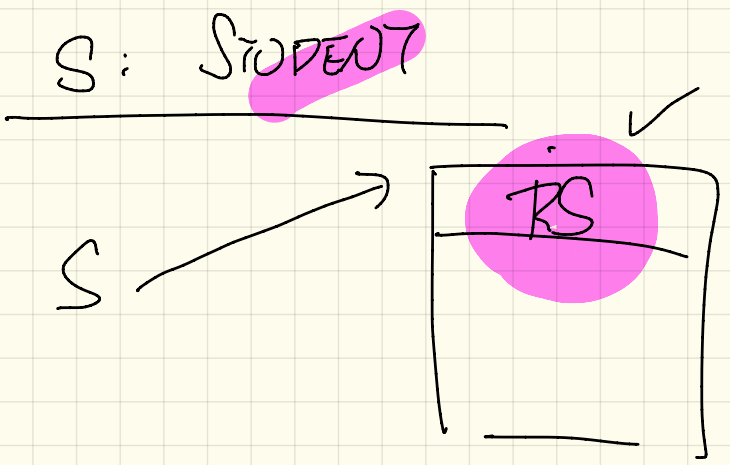
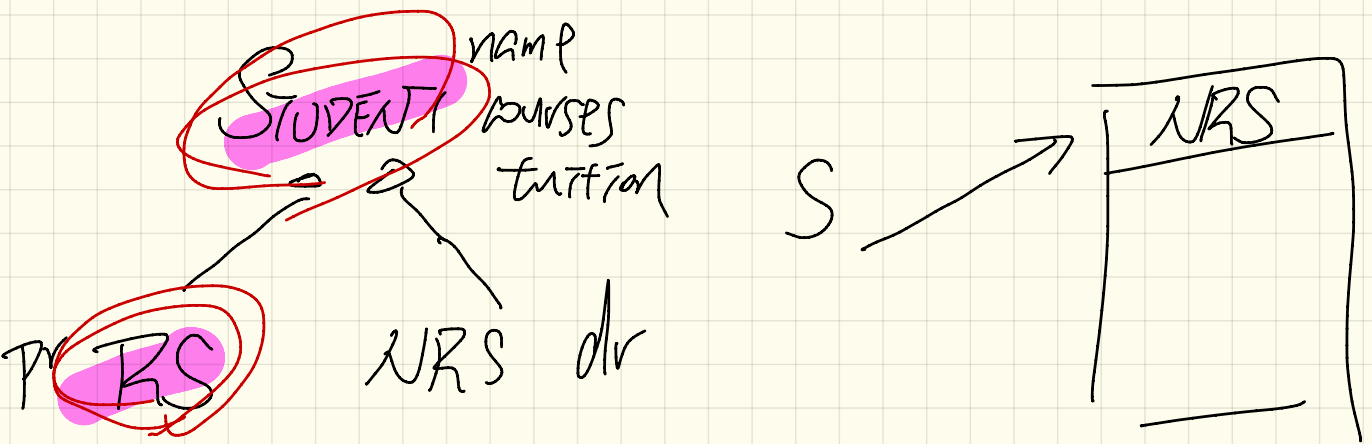
ancestors of A:
 A, B, D

dependents

$A \quad E \quad F$

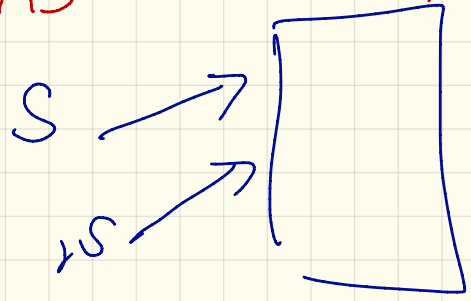


object variable	expression
od	od.d
ob	ob.b ob.d
oa	oa.a oa.b od



S :=)
 ↓
 assignment.

$\frac{rS}{ST:RS} := \frac{S}{ST:STUDENT} \quad X$



We substitute rS for S.

S: STUDENT
 rS: RS
 rRS: NRS

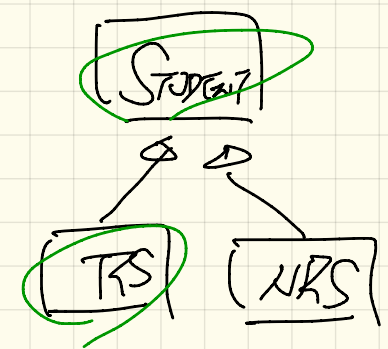
$\frac{S}{ST:STUDENT} := \frac{rS}{ST:RS} \quad \checkmark$

Should this assignment complete?
 Is the ST of rS a descendant class of ST of S?

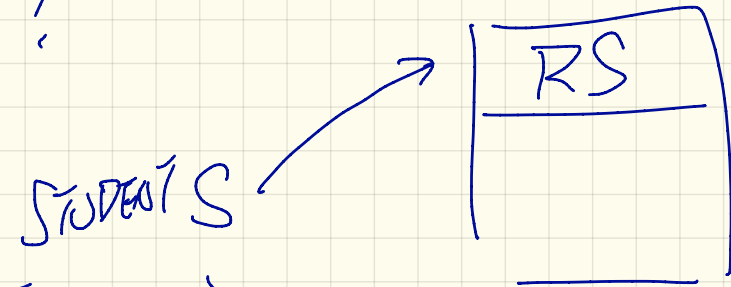


S: STUDENT

CREATE {RS} S.make(...)



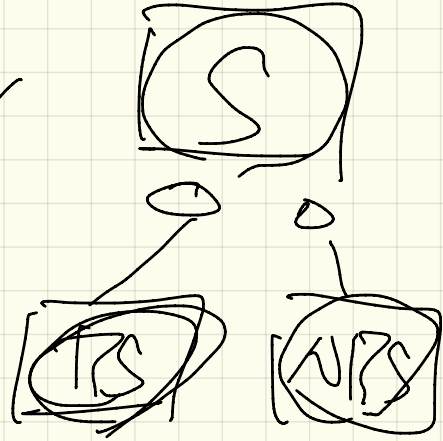
do they compile?



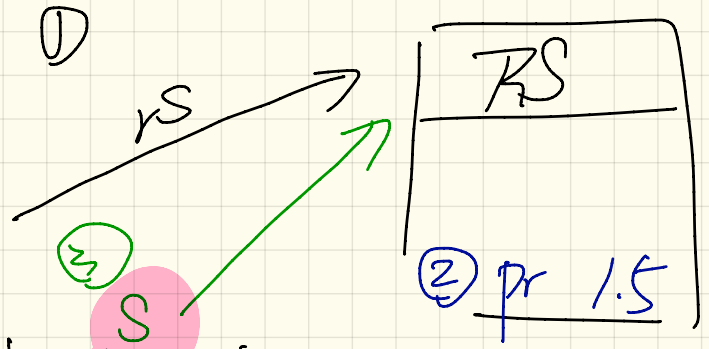
Is the new DT (RS) a dependent class of the ST of S?
STUDENT

rs: RS

- ① create {STUDENT} vs. make (...) X
- ② create {KRS} vs. make (...) X
- ③ create {RS} vs. make (...) ✓



S: STUDENT
rs: RS

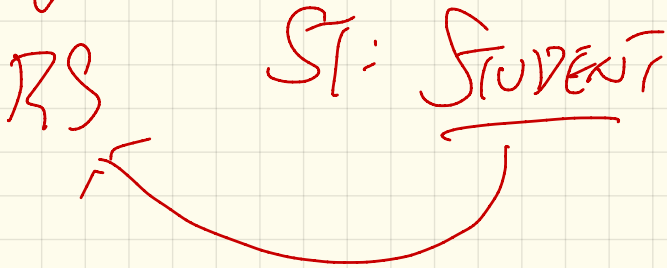
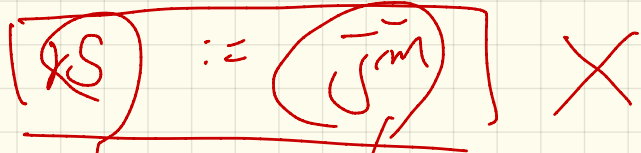
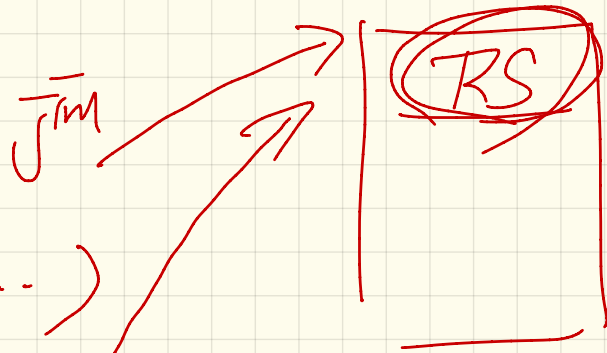


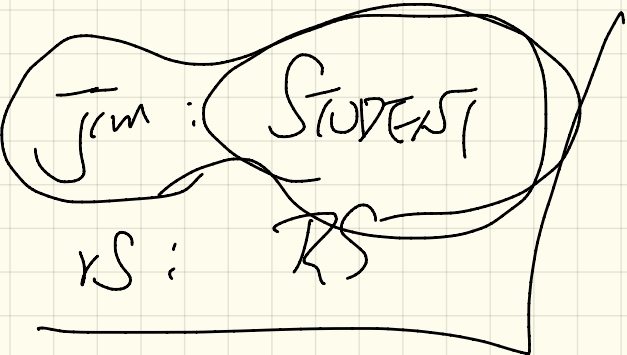
- ① create {RS} rs. make (..)
- ② rs. set_pr(1.5)
- ③ S := rs
- ④ S. set_pr(1.7)

X does not compile
∵ ST of S (STUDENT)
does not have
set_pr feature.

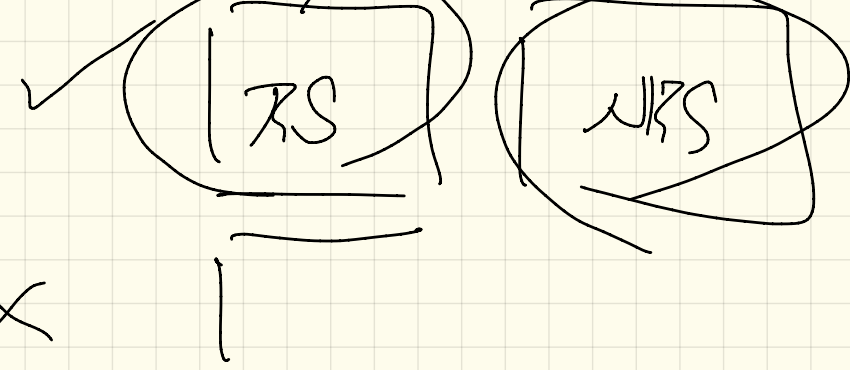
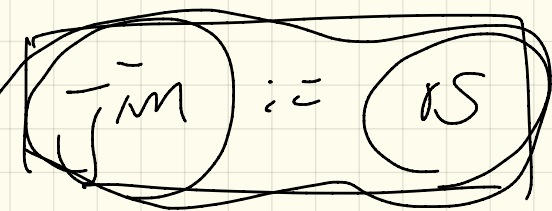
\bar{jim} : STUDENT
RS: RS

create {RS} $\bar{jim}.make(\dots)$





$RS := S \times$



Jim.set-pr x

Jim.set-pb

S: STUDENT*

create {STUDENT} s. make X