

$\neg(x, y)$

$\exists v: (\tau(v, x) \wedge \tau_s(x, y, v)) \wedge \exists w: (\tau(w, y) \wedge \tau_s(y, x, w))$

Free:  $\{x, y\}$      $\{v, x\}$      $\{x, y, v\}$     (1)    (2)     $\{x, y\}$      $\{w, y\}$      $\{y, x, w\}$

$\{v, x\}$      $\{w, y\}$

$\{x, y\}$      $\{y\}$

$\rightarrow$  SRNF

RANF: (1) : -  
(2) : -

Nov 16-10:12

(1): push (2) into  $\exists(1)$

$\exists v: (\tau(v, x) \wedge \tau_s(x, y, v) \wedge \exists w: (\tau(w, y) \wedge \tau_s(y, x, w)))$

$\exists v, w: (\tau(v, x) \wedge \tau(w, y) \wedge \tau_s(x, y, v) \wedge \tau_s(y, x, w))$

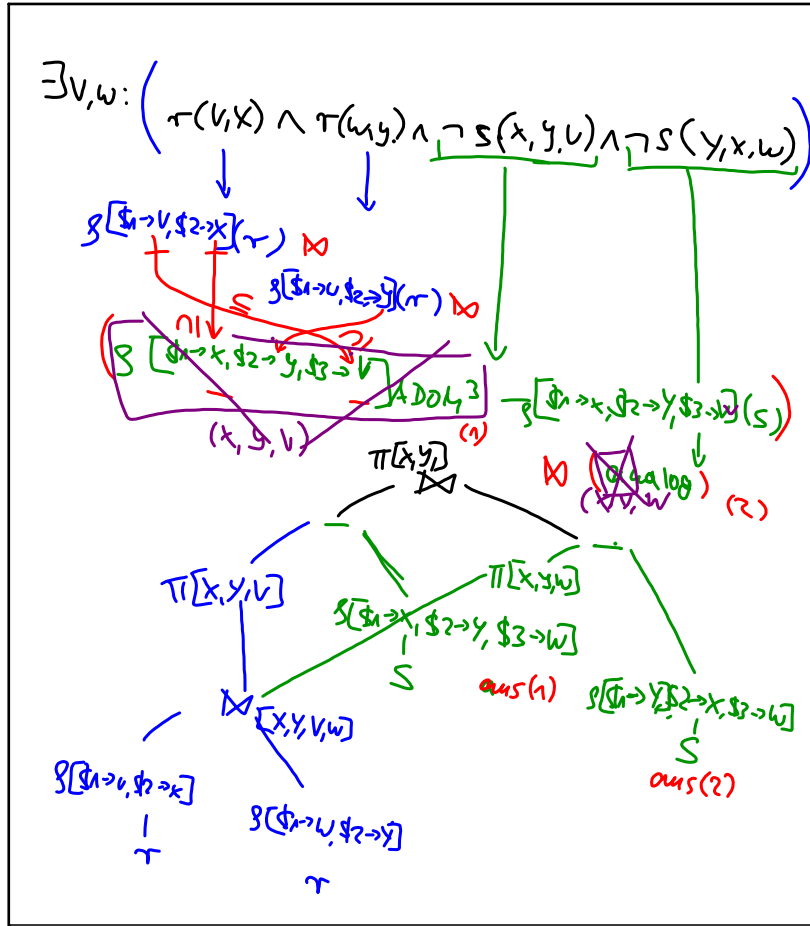
(2) push (1) into  $\exists(2)$   $\rightarrow$  exactly the same

$(\wedge \wedge 2) \wedge (\cancel{2 \wedge 1})$

$\rightarrow$  Rec =  $\pi \Rightarrow$  RANF

$\rightarrow$  Algebra

Nov 16-10:32



Nov 16-10:38

oder direkt

$\exists v, w: (\tau(v, x) \wedge \neg s(x, y, v) \wedge \tau(w, y) \wedge \neg s(y, x, w))$

Nov 16-10:51

2) a)

b)

$\sigma[\text{code}=\text{code}]$   
 $\pi[\text{code}]$   
 $\pi[\text{code}]$   
 $\pi[\text{code}]$   
 $\pi[\text{code}]$

a)

$$F_1(C) = \exists L, P: \text{language}(C, L, P) \wedge \exists P_2: \text{language}('CH', L, P_2)$$

b)

$$F_2(X) = \exists N, P, A, G, CP: \text{country}(N, X, P, A, G, CP) \wedge \neg F_1(X)$$

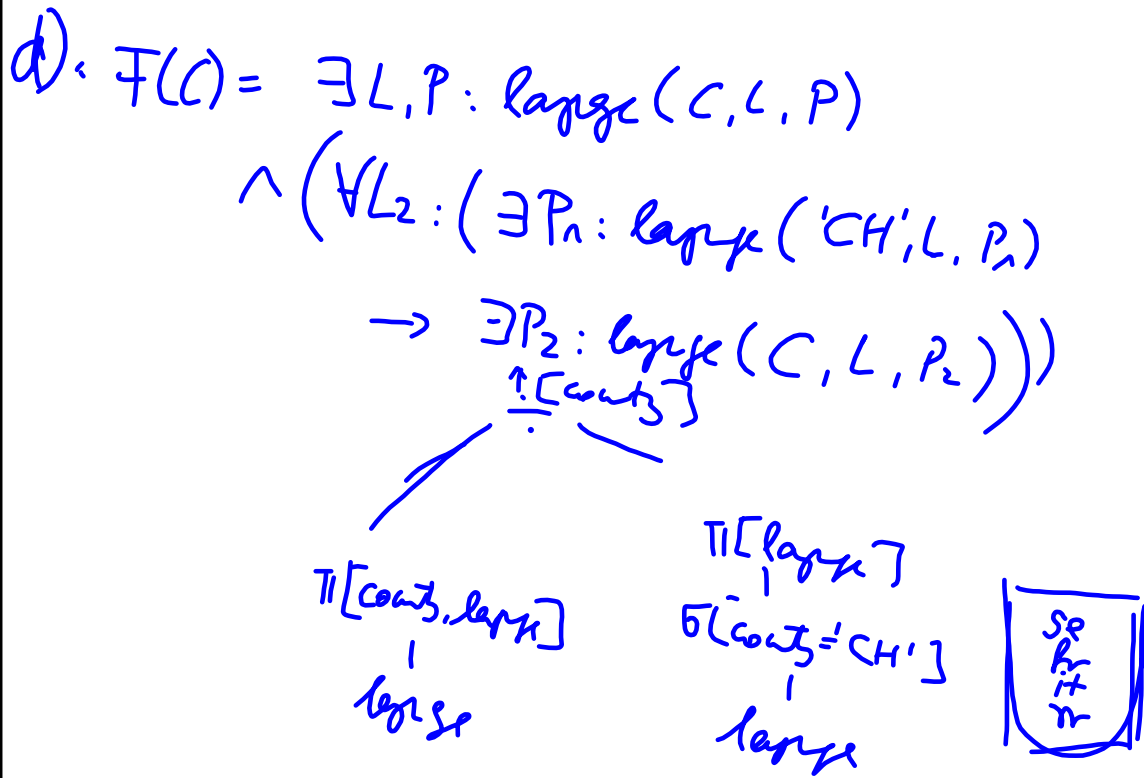
oder

$$F_2(X) = \exists N, P, A, G, CP: \text{country}(N, X, P, A, G, CP) \wedge \neg \exists L: (\exists P_1: \text{language}(X, L, P_1) \wedge \text{language}('CH', L, P_2))$$

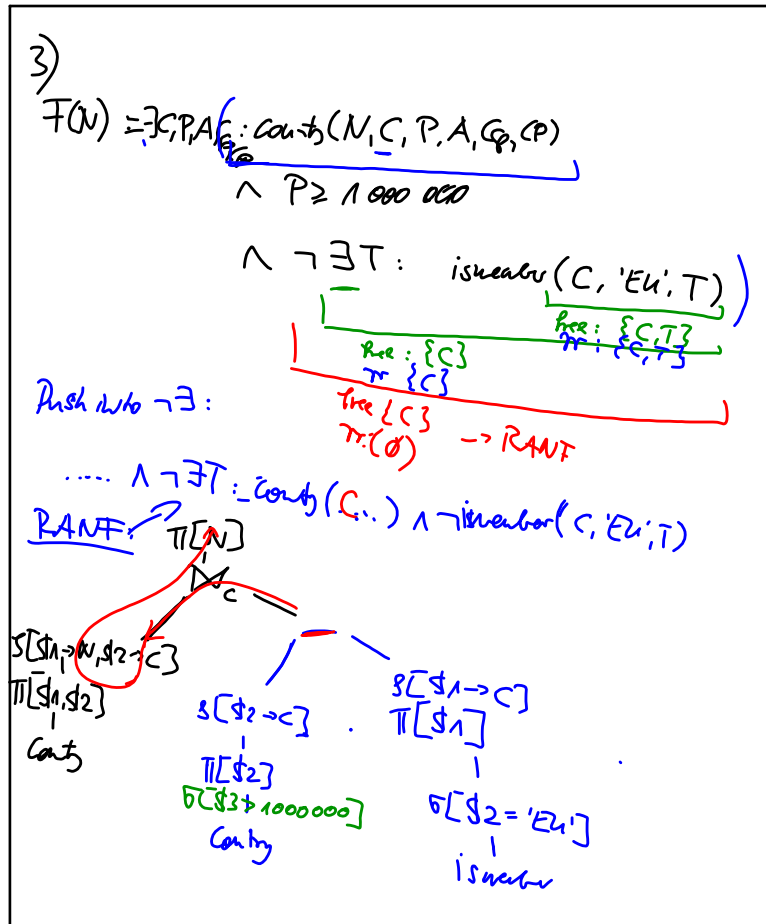
Nov 16-10:54

$$c) F(C) = \exists N, A, P, G, CP: \text{country}(N, C, A, P, G, CP) \wedge \forall L: ((\exists P_1: \text{language}(C, L, P_1)) \rightarrow \exists P_2: \text{language}('CH', L, P_2))$$

select code  
 from country  
 where not exists (select \* from language I1  
 where I1.country=code  
 and not exists (select \*  
 from language I2  
 where I2.name=I1.name  
 and I2.country='CH'))



Nov 16-11:12



Nov 16-11:17

$$4) \tau \div S = \{ \mu \in \text{Typ}(A) : \{ \mu \} \times S \subseteq \tau \}$$

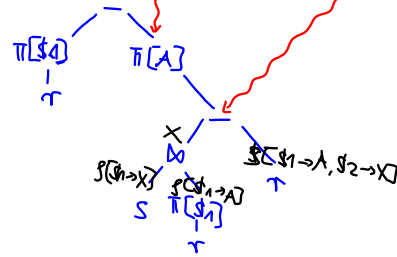
inbeziehung:

$$F(A) = \text{ADOM}(A) \wedge \forall x: s(x) \rightarrow \tau(A, x)$$

$$= \exists y: \tau(A, y) \wedge \forall x: s(x) \rightarrow \tau(A, x)$$

$$= \exists y: \tau(A, y) \wedge \neg \exists x: s(x) \wedge \neg \tau(A, x)$$

$$= \exists y: \tau(A, y) \wedge \neg \exists x: s(x) \wedge \exists y: \tau(A, y) \wedge \neg \tau(A, x)$$



Nov 16-11:32