Sl. 333:
TBox · Definitions

$C \equiv$ DL-Construct

Parent $\equiv$ Person $\sqcap \exists$ hasChild.$\top$

Usually: for each named class there is exactly one definition

· Assertions

$C \sqsubseteq \ldots\ldots$

$C \sqsubseteq D$

Parent $\sqsubseteq \forall$ hasChild.Person

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Sl. 333

as N3

C_1 owl:equivalentClass
[owl:intersectionOf (A B)].

C_2 rdfs:subclassOf A, B.

SPARQL:
select *
where {C_1 owl:equivalentClass C_2} $\Rightarrow$? $C_1 \sqsubseteq C_2$
? $C_2 \sqsubseteq C_1$

Answer: empty $\hat{=}$ No.

in DL

$C_1 \equiv A \sqcap B$ Def.

$C_2 \sqsubseteq A$
$C_2 \sqsubseteq B$ Assertions

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1) Tableau for $C_1 \sqsubseteq C_2$:

$C_1 \equiv A \sqcap B$
$C_2 \sqsubseteq A$
$C_2 \sqsubseteq B$

} given Knowledge

$\neg(C_1 \sqsubseteq C_2)$

negated query ⇓ Close Tableau?

$C_1(x)$
$\neg C_2(x)$
$A(x)$
$B(x)$

no more steps ⇒ Tableau open

⇒ Found an $x \in C_1$, $x \notin C_2$

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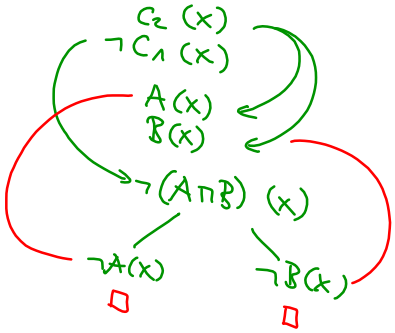
2) Tableau for $C_2 \sqsubseteq C_1$

$C_1 \equiv A \sqcap B$
$C_2 \sqsubseteq A$
$C_2 \sqsubseteq B$

} given Knowledge

$\neg (C_2 \sqsubseteq C_1)$



⇒ $\neg(C_2 \sqsubseteq C_1)$ is not possible

⇒ $C_2 \sqsubseteq C_1$

But (from previous Slide/Tableau) there might be an x s.t. $x \in C_1$, but not in C_2

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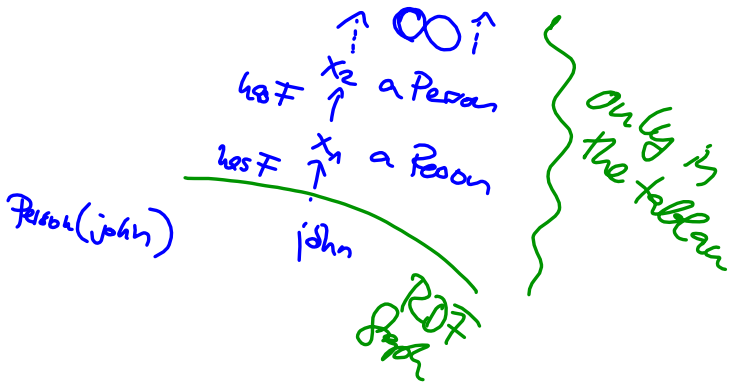
Assertion: for every Person, something must hold

Person $\sqsubseteq$ $\exists$ hasFather. Person



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"standard model" in mathematics:

Consider $\mathbb{N}$:

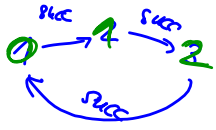
$\mathbb{N}(0)$ $\quad \mathbb{N}(n) \to \mathbb{N}(succ(n))$

$\to 0, 1, succ(0), succ(succ(0)), \ldots succ^k(0)$

0 1 2 3 ... k

Our "natural numbers" are the "standard model" of this spec

$\Rightarrow$ there exist further models:



$succ(2) = 0$

$\hat{=}$ $\mathbb{Z}_3$

some additional equalities

a "nonstandard model" of the spec of $\mathbb{N}$

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