

SP 33 :

$\text{Emp}(\text{john})$. $\text{Dept}(\text{Sales})$.
 $\text{Emp}(\text{alice})$. $\text{Dept}(\text{production})$.
 $\text{name}(\text{john}, \text{"John"})$.
 $\text{name}(\text{alice}, \text{"Alice"})$.
 $\text{salary}(\text{john}, 50000)$.
 \vdots
 $\text{inf}(\text{john}, 5045)$.
 $\text{mg}(\text{alice}, 5048)$.

in FOL:

$$\boxed{\mathcal{I} = (\mathcal{D}, \mathcal{I})}$$

$$\mathcal{D} = \{ \text{john}, \text{alice}, \text{Sales}, \dots \} \cup \text{STRING} \cup \text{NUMBER}$$

$$\mathcal{I}(\text{Emp}) = \{ (\text{john}), (\text{alice}), \dots \}$$

$$\mathcal{I}(\text{name}) = \{ (\text{john}, \text{"John"}), \dots \}$$

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Same in Description Logics

$$\boxed{\begin{array}{l} \text{recall: } \text{Parent} \equiv \exists \text{child. Person} \\ \text{Person} \equiv \forall \text{child. Person} \\ \text{childless} \equiv \neg \text{Parent} \end{array}}$$

$$\text{Mgr} \subseteq \text{Emp}$$

$$\text{Tlgr} \subseteq \text{Mgr}$$

$$\text{Mgr} \equiv \text{Tlgr} \sqcup \text{AMgr}$$

$$\text{AMgr} \subseteq \neg \text{Tlgr}$$

$$\exists \text{name.T} \subseteq \text{Emp} \sqcup \text{Dept}$$

$$\exists \text{salary.T} \subseteq \text{Emp}$$

$$\exists \text{sub.T} \subseteq \text{Emp} \quad \text{Domain}$$

$$T \subseteq \forall \text{sub. Mgr} \quad \text{Range}$$

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Sf 45

Create view sibling as

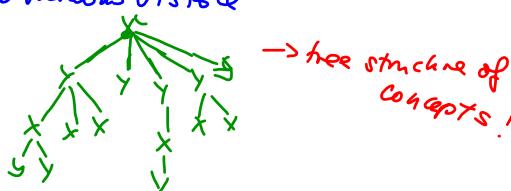
Select $c_1.\text{child}, c_2.\text{child}$
 from child $c_1, \text{child } c_2$
 where $c_1.\text{parent} = c_2.\text{parent}$
 and $c_1.\text{child} \neq c_2.\text{child}$

$\frac{\text{Child}}{\text{Parent}}$
 $\frac{\text{Child}}{\text{Child}}$

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Sf so
 2 variables,
 "grandfather"
 $\forall x. (\text{IsGrandfather}(x) \leftarrow (\exists y. \text{hasChild}(x, y) \wedge \exists z. \text{hasChild}(y, z))$
 $\quad \quad \quad \text{uses only two variables}$
 $\forall x. \text{IsParent}(x) \leftarrow \exists y. \text{hasChild}(x, y)$
 $\forall x. \text{IsGrandfather}(x) \leftarrow \exists y. \text{hasChild}(x, y) \wedge \text{IsParent}(y)$
 $\exists c. \text{Parent} \equiv \exists \text{child}. T$
 $\text{GrandParent} \equiv \exists \text{child}. \boxed{\text{Parent}}$
 $\text{GrandParent} \equiv \exists \text{child}. (\exists \text{child}. T)$

only two marks visible



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