

Q. 198 :

Content ("Asia", 4500.000)

- ground formula
Closed formula

- atomic formula

→ fact, can be seen as an assertion

→ can be seen as a "boolean query".

Does it hold (in my database)?

→ YES

Apr 16-10:13

Content("Asia", X)

↑ free

Can be read as a query:

for which X does it hold (in my database)

answer: X/45000000

Apr 16-10:25

$\mathcal{I} : \text{Term} \times \text{Var Bindings} \rightarrow \mathcal{D}$
 $\mathcal{V} : \text{Formula} \times \text{Var Bindings} \rightarrow \{T, F\}$

$$\begin{aligned}
 & \mathcal{V}(\text{plus}(3,4)) \\
 &= (I(\text{plus})) (\mathcal{V}(3), \mathcal{V}(4)) \\
 I(\text{plus}) : &= (I(\text{plus})) (3_{\mathbb{N}}, 4_{\mathbb{N}}) \\
 (3,4) &\mapsto 7 \\
 &= \mathbb{T}_{\mathbb{N}} = 7
 \end{aligned}$$

Apr 16-10:53

Aside S2.403:

(our) Database:

does $\text{isMember}("D", "EN")$ hold?

Yes, it is in the DB

does $\text{isMember}("USA", "E2")$ hold?

$\text{isMember}("USA", "E2")$ is not in the DB

\Rightarrow conclude that it does not hold!

\hookrightarrow next page

Apr 16-11:03

$\text{is_member}("D", "EU") \wedge \text{is_member}("F", "EU")$
 $\rightarrow \text{is_member}("D", "EU")$
 "holds" in all interpretations
 $\mathcal{I}_1: \text{is_member}("D", "EU") \wedge \text{is_member}("F", "EU")$
 $\rightarrow \text{is_member}("USA", "EU")$
 $\mathcal{I}_2: \text{is_member}("D", "EU") \wedge \text{is_member}("F", "EU")$
 $\rightarrow \text{is_member}("USA", "EU")$
 we don't know whether it holds in some interpretation
 $\mathcal{I}_1 = (\mathcal{I}_1, \mathcal{D})$ all strings
 $\mathcal{I}_1(\text{is_member}) = \{ ("D", "EU"), ("F", "EU"), ("B", "EU") \}$
 $\mathcal{S}_1 \neq \bar{\mathcal{F}}_1$
 $\mathcal{S}_1 \neq \mathcal{F}_2$

 $\mathcal{I}_2 = (\mathcal{I}_2, \mathcal{D})$
 $\mathcal{I}_2(\text{is_member}) = \{ ("D", "EU"), ("F", "EU"), ("USA", "EU") \}$
 $\mathcal{S}_2 \neq \bar{\mathcal{F}}_1$
 $\mathcal{S}_2 \neq \mathcal{F}_2$ neither $\bar{\mathcal{F}}_1$ nor \mathcal{F}_2 are tautologies
FOL: "Open World" \rightarrow Reasoner
DB: "Closed World" \rightarrow Negation
 by default,
 everything that is not POSITIVELY asserted does not hold!
 \rightarrow allows for algorithmic evaluation

Apr 16-11:05