

EECS 4401/5326 Winter 2022  
Week 6 — Additional Examples — 18/02/2022

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## Example 1

Suppose that we have the default logic theory  $\langle \mathcal{D}, \mathcal{F} \rangle$ , where

$$\mathcal{D} = \{ \langle \text{OperaFan}(x) \Rightarrow \text{WineDrinker}(x) \rangle \} \text{ and}$$

$$\mathcal{F} = \{ \text{OperaFan}(\text{john}), \text{JazzFan}(\text{bob}) \}?$$

What are the extension(s) of this default logic theory?

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What are the extension(s) of this default logic theory?

Only one extension

$$\{ \phi \mid \mathcal{F} \cup \{ \text{WineDrinker}(\text{john}) \} \models \phi \}$$

## Example 2

Suppose that we have the default logic theory  $\langle \mathcal{D}, \mathcal{F} \rangle$ , where

$$\mathcal{D} = \{ \langle \text{OperaFan}(x) \Rightarrow \text{WineDrinker}(x) \rangle, \langle \text{RockFan}(x) \Rightarrow \neg \text{WineDrinker}(x) \rangle \}$$

$$\text{and } \mathcal{F} = \{ \text{OperaFan}(\text{john}), \text{RockFan}(\text{john}), \text{RockFan}(\text{bob}) \}?$$

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## Example 2

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What are the extension(s) of this default logic theory?

Two extensions:

$$\{ \phi \mid \mathcal{F} \cup \{ \text{WineDrinker}(\text{john}), \neg \text{WineDrinker}(\text{bob}) \} \models \phi \}$$

and

$$\{ \phi \mid \mathcal{F} \cup \{ \neg \text{WineDrinker}(\text{john}), \neg \text{WineDrinker}(\text{bob}) \} \models \phi \}$$

## Example 3

Let  $KB = \{Student(john), Student(mary)\}$

Does  $KB \models \neg Student(paul)$ ?

Does  $KB \models_{CWA} \neg Student(paul)$ ?

## Example 4

Let  $KB = \{Student(john), (Student(mary) \vee Student(paul))\}$ .

Does  $KB \models_{CWA} \neg Student(paul)$ ?

Does  $KB \models_{CWA} \neg Student(mary)$ ?

$KB \cup Negs$  consistent?

## Example 5

Let  $KB = \{OperaFan(john), \forall x. OperaFan(x) \wedge \neg Ab(x) \supset WineDrinker(x)\}$

Does  $KB \models WineDrinker(john)$ ?

Does  $KB \models_{\leq} WineDrinker(john)$ ?



## Example 6

Let  $KB = \{OperaFan(john) \vee OperaFan(mary), \forall x. OperaFan(x) \wedge \neg Ab(x) \supset WineDrinker(x)\}$

Does  $KB \models_{\leq} WineDrinker(john)$ ?

Does  $KB \models_{\leq} WineDrinker(john) \vee WineDrinker(mary)$ ?