《人工智能逻辑》作业W9

朱致远 3220101842 人工智能

2024.4.25

Q1.用外延的的不动点定义求如下缺省理论的外延：

$$D = \left\{ \frac{\text{quaker}(x):\text{pacifist}(x)}{\text{pacifist}(x)}, \frac{\text{republican}(x):\neg\text{pacifist}(x)}{\neg\text{pacifist}(x)} \right\}$$

$W = \{\text{quaker}(\text{Nixon}), \text{republican}(\text{Nixon})\}$

首先构造Herbrand域，由于只有一个常元Nixon，所以Herbrand域为$\{Nixon\}$

设$\theta = \{x/\text{Nixon}\}$，则有

$$D\theta = \left\{ \frac{\text{quaker}(\text{Nixon}): \text{pacifist}(\text{Nixon})}{\text{pacifist}(\text{Nixon})}, \frac{\text{republican}(\text{Nixon}) : \neg\text{pacifist}(\text{Nixon})}{\neg\text{pacifist}(\text{Nixon})} \right\}$$

得到缺省理论$T' = \langle W, D\theta \rangle$，并给出三个语句集合：

$\Phi_1 = Th(W) = W = \{\text{quaker}(\text{Nixon}), \text{republican}(\text{Nixon})\}$
$\Phi_2 = Th(W \cup \{\text{pacifist}(\text{Nixon})\})$
$\Phi_3 = Th(W \cup \{\neg\text{pacifist}(\text{Nixon})\})$

则在通过Γ算子运算后，我们有：

$\Gamma(\Phi_1) = Th(W \cup \{\text{pacifist}(\text{Nixon}), \neg\text{pacifist}(\text{Nixon})\})$
是不稳定的
$\Gamma(\Phi_2) = Th(W \cup \{\text{pacifist}(\text{Nixon})\}) =$
$\{\text{quaker}(\text{Nixon}), \text{republican}(\text{Nixon}), \text{pacifist}(\text{Nixon})\} = \Phi_2$
$\Gamma(\Phi_3) = Th(W \cup \{\neg\text{pacifist}(\text{Nixon})\}) =$
$\{\text{quaker}(\text{Nixon}), \text{republican}(\text{Nixon}), \neg\text{pacifist}(\text{Nixon})\} = \Phi_3$

因此，我们有：

$\Phi_2 = Th(W \cup \{\text{pacifist}(\text{Nixon})\}) =$
$\{\text{quaker}(\text{Nixon}), \text{republican}(\text{Nixon}), \text{pacifist}(\text{Nixon})\}$

$\Phi_3 = Th(W \cup \{\neg\text{pacifist}(\text{Nixon})\}) =$
$\{\text{quaker}(\text{Nixon}), \text{republican}(\text{Nixon}), \neg\text{pacifist}(\text{Nixon})\}$

为缺省理论T'的外延，也是$T = \langle W, D \rangle$的外延