

# MAS Assessed Coursework 2 – Argumentation

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March 2, 2015

**3a**

$| ? - grounded(X).$

Result:

$X = (free6(a), [free6(a)]) ? ;$   
 $X = (free8(b), [free8(b)]) ? ;$   
 $X = (child(a), [child(a)]) ? ;$   
 $X = (overweight(b), [overweight(b)]) ? ;$   
 $X = (not\_free8(a), [child(a)]) ? ;$   
 $X = (not\_sports(b), [overweight(b)]) ? ;$   
 $X = (not\_get8(a), [not\_get8(a)]) ? ;$   
 $X = (free6(b), [free6(b)]) ? ;$   
*no*

As it can be seen from the result of grounded extensions,  $free6(b)$  is part of the grounded extensions.

**3bi**

	$\mathcal{P}$	$\mathcal{O}$	$D$	$C$
0	$\{\{\} \vdash_{\{free6(b)\}} free6(b)\}$	$\{\}$	$\{free6(b)\}$	$\{\}$
1	$\{\}$	$\{\{\} \vdash_{\{not\_free6(b)\}} not\_free6(b)\}$	$\{free6(b)\}$	$\{\}$
2	$\{\}$	$\{\{\} \vdash_{\{sports(b)\}} not\_free6(b)\}$	$\{free6(b)\}$	$\{\}$
3	$\{\{\} \vdash_{\{not\_sports(b)\}} not\_sports(b)\}$	$\{\}$	$\{free6(b)\}$	$\{sports(b)\}$
4	$\{\{\} \vdash_{\{overweight(b)\}} not\_sports(b)\}$	$\{\}$	$\{free6(b), overweight(b)\}$	$\{sports(b)\}$
5	$\{\}$	$\{\{\} \vdash_{\{not\_overweight(b)\}} not\_overweight(b)\}$	$\{free6(b), overweight(b)\}$	$\{sports(b)\}$
6	$\{\}$	$\{\}$	$\{free6(b), overweight(b)\}$	$\{sports(b)\}$

	Details
0	Initial setup
1	$\mathcal{P}$ : selected $free6(b)$ , add it to Defense set, $free6(b)$ is an assumption, start "attack" in $\mathcal{P}$
2	$\mathcal{O}$ : selected $not\_free6(b)$ , $not\_free6(b)$ is not an assumption, hence unfold it
3	$\mathcal{O}$ : selected $sports(b)$ , $sports(b)$ is not already in the Culprit set, hence add it to Culprit set
4	$\mathcal{P}$ : selected $not\_sport(b)$ , $not\_sport(b)$ is not an assumption, hence unfold it then expand the Defense set
5	$\mathcal{P}$ : selected $overweight(b)$ , $overweight(b)$ is an assumption, start "attack" in $\mathcal{P}$
6	$\mathcal{O}$ : selected $not\_overweight(b)$ , $not\_overweight(b)$ is not an assumption, with no rule to unfold to, hence terminate

### 3bii

$$\begin{array}{c}
\{\} \vdash_{\{free6(b)\}} free6(b) \\
\uparrow \\
\{\} \vdash_{\{sports(b)\}} not\_free6(b) \\
\uparrow \\
\{\} \vdash_{\{overweight(b)\}} not\_sports(b)
\end{array}$$

### 3c

According to the grounded extension(see part 3a), argument  $not\_get8(a)$  in the extension suggests that  $a$  should not get the 8 a.m appointment, instead  $a$  should get the 6 p.m one whilst  $b$  gets the 8 a.m appointment.

For stable extension, we ran the query  $| ?-argument((X, -))$ . to obtain the following arguments:

$X = free6(a) ? ;$   
 $X = free8(a) ? ;$   
 $X = free6(b) ? ;$   
 $X = free8(b) ? ;$   
 $X = sports(b) ? ;$   
 $X = child(a) ? ;$   
 $X = overweight(b) ? ;$   
 $X = not\_get6(a) ? ;$   
 $X = not\_get8(a) ? ;$   
 $X = not\_get6(b) ? ;$   
 $X = not\_get8(b) ? ;$   
 $X = get6(a) ? ;$   
 $X = get6(b) ? ;$   
 $X = get8(b) ? ;$   
 $X = get8(a) ? ;$   
 $X = not\_free6(b) ? ;$   
 $X = not\_free8(a) ? ;$   
 $X = not\_sports(b) ? ;$

and the query  $| ?-attack((X, -), (Y, -))$ . to obtain a list of attack relations between arguments:

$X = get6(a),$   
 $Y = not\_get6(a) ? ;$   
 $X = get6(a),$   
 $Y = get6(b) ? ;$   
 $X = get6(a),$   
 $Y = get8(a) ? ;$   
 $X = get6(b),$   
 $Y = not\_get6(b) ? ;$   
 $X = get6(b),$   
 $Y = get6(a) ? ;$   
 $X = get6(b),$   
 $Y = get8(b) ? ;$   
 $X = get8(b),$   
 $Y = not\_get8(b) ? ;$   
 $X = get8(b),$   
 $Y = get6(b) ? ;$   
 $X = get8(b),$   
 $Y = get8(a) ? ;$

$X = get8(a),$   
 $Y = not\_get8(a) ? ;$   
 $X = get8(a),$   
 $Y = get6(a) ? ;$   
 $X = get8(a),$   
 $Y = get8(b) ? ;$   
 $X = not\_free6(b),$   
 $Y = free6(b) ? ;$   
 $X = not\_free6(b),$   
 $Y = get6(b) ? ;$   
 $X = not\_free8(a),$   
 $Y = free8(a) ? ;$   
 $X = not\_free8(a),$   
 $Y = get8(a) ? ;$   
 $X = not\_sports(b),$   
 $Y = sports(b) ? ;$   
 $X = not\_sports(b),$   
 $Y = not\_free6(b) ? ;$

Stable extensions were then obtained using the tool ASPARTIX with translated arguments and attacks:

{ free6a, free6b, free8b, childa, overweightb, **notget8a, notget6b, get6a, get8b**, notfree8a, notsportsb } and { free6a, free6b, free8b, childa, overweightb, **notget6a, notget8a, notget8b, get6b**, notfree8a, notsportsb }. From the result, we can see that  $a$  should get the 6 p.m appointment and  $b$  should get the 8 a.m appointment.