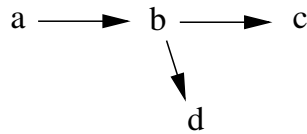


# CIS 7412 Fall 2011 Homework 7

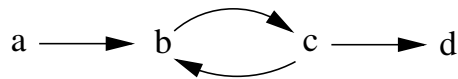
1. Compute the preferred extensions of the following sets of arguments.

(a)  $(\{a, b, c, d\}, \{(a, b), (b, c), (b, d)\})$ , which we can picture as:



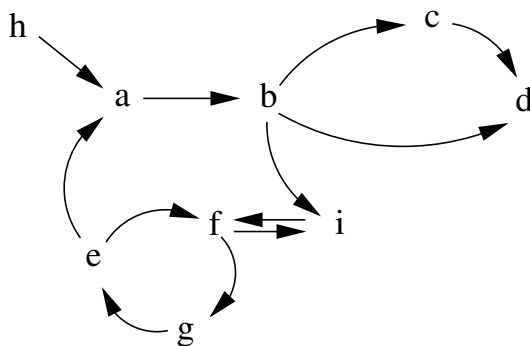
(10 points)

(b)  $(\{a, b, c, d\}, \{(a, b), (b, c), (c, b), (c, d)\})$ , which we can picture as:



(10 points)

2. Compute the grounded extension of the following set of arguments.



(20 points)

3. Here is some information that an agent has about films.

$SpanishFilm(hce)$   
 $IndieFilm(hce)$   
 $IndieFilm(X) \wedge SpanishFilm(X) \rightarrow \neg Watch(X)$   
 $DirectedBy(almodovar, hce)$   
 $DirectedBy(almodovar, X) \rightarrow Watch(X)$   
 $DirectedBy(almodovar, X) \rightarrow \neg IndieFilm(X)$

where  $X$  is a variable that can be instantiated by any constant. Constants all helpfully start with lower-case letters.

From this information you should be able to construct arguments about whether or not the agent should  $Watch(hce)$ , and whether or not  $hce$  (which denotes the film "Hable con ella") is an indie film.

Which of these arguments are in the grounded extension? Why?

(20 points)

4. Consider two agents  $A_1$  and  $A_2$ .

$A_1$  has been assigned tasks  $a$ ,  $b$  and  $c$ , which will cost it 30, 40 and 30 units of effort, respectively, to complete.

$A_2$  has been assigned tasks  $e$ ,  $f$  and  $g$ , which will cost it 40, 50 and 30 units of effort, respectively, to complete.

$A_1$  estimates that it could carry out  $e$  for just 20,  $f$  for 40 and  $g$  for 30, while  $A_2$  thinks it could complete  $a$  for 30,  $b$  for 20 and  $c$  for 20.

- (a) Identify a deal, in the terminology of task oriented domains, that is individually rational for both agents.  
(10 points)
- (b) Show how the two agents could use the monotonic concession protocol to reach a deal (which does not have to be the one you identified in (a)).  
(20 points)
- (c) Comment on the deal that is reached. Does this seem reasonable? Does the process by which it was reached seem reasonable?  
(10 points)