

Higher Information Systems

2006 q.25c Expert Systems Conflict Resolution

An expert system uses a forward chaining inferencing strategy. In a forward chaining system, explain:

- (i). why conflict resolution is necessary **(2)**
 - (ii). the purpose of the RETE algorithm **(2)**
 - (iii). how the specificity conflict resolution strategy works. **(2)**
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2006 q.27 Expert Systems Conflict Resolution

Consider a forward chaining expert system containing the following rule base, where letters P - W represent facts which are known or can be concluded.

- 1 If P and V then X.
- 2 If P and S then V.
- 3 If P and Q then V.
- 4 If P and R then T.
- 5 If P and R and T then W.
- 6 If P and Q and R then U.

Suppose the working memory contains the facts P, Q and R, added in that order.

- a. Which rules exist in the conflict set? **(2)**

 - b. (i). Which rule will fire using a first-come-first-served (also known as rule ordering) conflict resolution strategy? **(1)**
 - (ii). Which rule will fire using the "specificity" conflict resolution strategy? **(1)**
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2007 22c Expert Systems Conflict Resolution

(c) The expert system uses *forward chaining*. In a forward chaining expert system:

- (i). explain what is meant by the *working memory*; **(2)**
- (ii). explain what is meant by a *conflict set*; **(2)**
- (iii). explain how a conflict set is identified; **(2)**
- (iv). describe how the *specificity* conflict resolution strategy works. **(2)**

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2007P q.26 Expert Systems Conflict Resolution

GlasgowDine is an expert system that recommends restaurants in Glasgow based on occasion, atmosphere and food preferences. It uses information provided by the user to decide what restaurant characteristics would be preferred for the event. The expert system uses forward chaining rules. Part of the expert system is shown below.

a. Maisie Mo is hosting a business lunch for clients in the centre of Glasgow. The lunch is to be a relaxed event for clients who enjoy European food.

Given the facts above, state the rules that would exist in the conflict set. **(2)**

b. What advice would be given to Maisie Mo by the GlasgowDine expert system if:

(i). a rule ordering algorithm was used to resolve the conflict? Justify your answer.

(ii). a specificity algorithm was used to resolve the conflict? Justify your answer. **(4)**

c. Evaluate the GlasgowDine expert system in terms of:

- its domain
- the range and coverage of the rules shown. **(2)**

R1 IF Occasion is family meal
AND Atmosphere is lively
AND Food preference is European
AND Cost is moderate
THEN Suitable restaurant is CharleyCool.

R2 IF Occasion is family meal
AND Atmosphere is lively
AND Food preference is European
THEN Suitable restaurant is Gr8@Gordos.

R3 IF Occasion is business lunch
AND Atmosphere is relaxed
AND Food preference is European
AND Location is city centre
THEN Suitable restaurant is Uropa.

R4 IF Occasion is business lunch
AND Atmosphere is relaxed
AND Food preference is European
THEN Suitable restaurant is ChisCo.

R5 IF Occasion is business lunch
AND Atmosphere is relaxed
AND Food preference is Asian

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2008 24 Expert Systems Conflict Resolution

Consider a *forward chaining* expert system containing the following rule base, where the letters G to R represent facts which are known or can be concluded.

- 1 **If G and H then P.**
- 2 **If G then K.**
- 3 **If H and J then L.**
- 4 **If G and H and L then M.**
- 5 **If H and N then R.**

Suppose the working memory contains facts G, H and J added in that order.

- a. (i). List the rules that exist in the conflict set. **(3)**
- (ii). Using *recency* conflict resolution strategy, state which rule would be fired first. **(2)**
- (iii). Explain why conflict resolution strategies are required. **(2)**

b. The following rule was added to the expert system. Represent this rule using propositional logic.

If G and not L then N (3)

2008P q.26d Expert Systems Conflict Resolution

Tom is interested in sailing and has decided to make an expert system regarding pleasure boats.

This is an example of a forward chaining rule-based expert system.

- (i). Explain why conflict resolution strategies are required in expert systems such as this. **(2)**
 - (ii). What is the purpose of the RETE algorithm? **(2)**
 - (iii). Describe how the refractoriness strategy for conflict resolution works. **(2)**
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2009 24 Expert Systems Conflict Resolution

- a. Name and describe **two** *conflict resolution strategies*. **(6)**
 - b. Explain why conflict resolution strategies are required. **(2)**
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2009P q.22b Expert Systems Conflict Resolution

An expert system uses forward chaining.

In a forward chaining expert system:

- (i) explain what is meant by the working memory. **(2)**
- (ii) explain what is meant by a conflict set. **(2)**
- (iii) describe how the specificity conflict resolution strategy works. **(2)**