

Questions 4: Search

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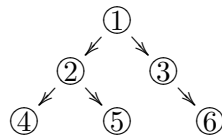
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Question 1

Briefly describe what is uninformed and informed search? Name examples of uninformed and informed search strategies in lists and trees.

Question 2

- Briefly describe the breadth-first and the depth-first search for trees.
- Consider the following graph:



Starting at root node 1, give the order in which the nodes will be visited by the breadth-first and depth-first algorithms.

Question 3

What is conflict resolution in expert systems? What conflict resolution methods are used? Give their brief descriptions.

Question 4

Consider the following familiar set of rules:

1		IF	<i>green</i>		THEN	<i>walk</i>
2		IF	<i>red</i>		THEN	<i>wait</i>
3		IF	<i>green AND blinking</i>		THEN	<i>hurry</i>
4		IF	<i>red OR green</i>		THEN	<i>traffic light works</i>

- Which of the above rules will be put into a conflict set by the system if the working memory contains two facts: *green*, *blinking*? Explain why each rule is selected or not.

- b) Which of the rules would fire if we used the specificity conflict resolution strategy? Explain why.

Question 5

Consider the following set of rules:

1		IF	<i>cyclone</i>		THEN	<i>clouds</i>
2		IF	<i>anticyclone</i>		THEN	<i>clear sky</i>
3		IF	<i>pressure is low</i>		THEN	<i>cyclone</i>
4		IF	<i>pressure is high</i>		THEN	<i>anticyclone</i>
5		IF	<i>arrow is down</i>		THEN	<i>pressure is low</i>
6		IF	<i>arrow is up</i>		THEN	<i>pressure is high</i>

Use backward chaining to reason about the weather if the working memory contains the fact: *clouds*. Show your answer in a table listing the rules matching the working memory (conflict set), which rule you apply, and changes to the working memory contents:

Cycle	Working Memory	Conflict set	Rule fired
⋮	⋮	⋮	⋮

Question 6

What reasoning direction is a more suitable heuristic in the game of Chess — forward or backward? What about the Rubik's cube puzzle? Justify your answers by referring to properties of the search space in each case.