

CPSC 433: Artificial Intelligence

Questions to prepare yourself for the Final

- Look at all the questions I gave you to prepare for the Midterm!
- For knowledge representation in general, what does syntax and semantics mean?
- What are the reasons/ways why the same knowledge can be represented very differently?
- Logics in general:
 - How are terms defined?
 - What are the different kinds of predicate symbols?
 - What is an atom?
 - What do we need in addition to terms and atoms to define formulas?
 - What is the definition of an interpretation?
 - What is a logic (formally)?
 - What are the components of a calculus?
 - What do we need in addition to a calculus to build a theorem prover?
- For propositional logic and first-order logic, how is the general definition of a logic instantiated?
- What are the advantages and disadvantages of propositional logic?
- What are the advantages and disadvantages of first-order logic?
- What calculi do you use for propositional logic and what calculi for first-order logic?
- Given a description and a goal, translate them into propositional logic (first-order logic) and use a given calculus to prove that the goal is a consequence of the description!
- What are concepts that cannot be easily expressed in propositional logic or first-order logic?
- Which modern logics are used instead to express the concepts from above?
- What is the general structure of a rule in a production system?
- What are the three key components in a rule-based system?
- What is the structure of a rule in PROLOG?
- What is the structure of a rule in MYCIN/EMYCIN?
- Given a PROLOG program and a query, produce the answer!
- Given a set of EMYCIN rules, the truth values of some initial statements and an additional statement, compute the interpretation of this additional statement!
- Given a description, produce a PROLOG program representing this description!
- Given a description, produce a set of EMYCIN rules representing this description!
- What is the logic behind MYCIN/EMYCIN?
- On what result of probability theory is EMYCIN based?
- What are the Measure of belief and the Measure of disbelief?
- What programming paradigm are frames related to?
- How can knowledge representation with frames be visualized?
- What does XML stand for?
- Given a DTD and a faulty tagged text, find the errors in the tags with respect to the DTD?
- Name other schemes than DTDs to represent semantics to validate XML expressions!
- What is an ontology used for with regard to XML?
- What are the components of an ontology?

- What connections can be there between concepts and ontologies?
- What are the advantages and disadvantages of XML?
- What was the goal in developing Semantic Nets?
- What are the basic data structures of Semantic Nets?
- What are nodes in Conceptual Dependency graphs used for?
- What are the actions in Conceptual Dependency graphs and what are their semantics?
- What are modifiers in Conceptual Dependency graphs and what are their semantics?
- How does knowledge processing with Conceptual Dependency graphs work?
- Given a statement, transform it into a Conceptual Dependency graph!
- What are the components of a neural network?
- What is the general structure of a neural network?
- What are the parameters of an activation function?
- What are the parameters of a learning function?
- Given a network structure, an activation function and a learning function, train the network on a given set of input-output behaviors!
- What are the problems neural networks have?
- How do constraints fit into knowledge representation?
- What are the advantages of using constraints together with another knowledge representation mechanism compared to just using the other mechanism?
- Given some piece of knowledge to represent, what knowledge representation mechanism should be looked at first, according to our rules of thumb?