1-Modeling

1.6-Using formal models





1.6-Using Models

- 1. Levels of formalization
- 2. Using logic



■ Problems to be solved using logics



1.6.2-Using logic

Lecture index

- Levels of formalization
- 2. Using logic



Examples of problems:

Use theory as basis for agreement developer/customer

Examples of problems:

- Use theory as basis for agreement developer/customer
- Use theory to guarantee semantic interoperability (e.g. as in data integration, program composition, ...)

Examples of problems:

- Use theory as basis for agreement developer/customer
- Use theory to guarantee semantic interoperability (e.g. as in data integration, program composition, ...)
- Use reasoning(⊨) to make sure program does what is supposed to do

Examples of problems:

- Use theory as basis for agreement developer/customer
- Use theory to guarantee semantic interoperability (e.g. as in data integration, program composition, ...)
- Use reasoning(|=) to make sure program does what is supposed to do
- Use reasoning to implement AI

Useful in interaction developer - customer:

- Useful in interaction developer customer:
 - Customer: how am i sure that you are implementing a system that does exactly what i want

- Useful in interaction developer customer:
 - Customer: how am i sure that you are implementing a system that does exactly what i want
 - ♦ Developer: how am i sure that you will not change the requirements later

- Useful in interaction developer customer:
 - Customer: how am i sure that you are implementing a system that does exactly what i want
 - Developer: how am i sure that you will not change the requirements later

 Mainly useful in high value applications (e.g. safety critical applications, security critical applications) because of its cost.

- Useful in interaction developer customer:
 - Customer: how am i sure that you are implementing a system that does exactly what i want
 - Developer: how am i sure that you will not change the requirements later

- Mainly useful in high value applications (e.g. safety critical applications, security critical applications) because of its cost.
- Largely solved, lots of solutions in the market

Useful in interaction between two developers/programs:

- Useful in interaction between two developers/programs:
 - ♦ How am i sure that a program understands the output of another program?

- Useful in interaction between two developers/programs:
 - How am i sure that a program understands the output of another program?
 - Syntactic compliance(easy)

- Useful in interaction between two developers/programs:
 - How am i sure that a program understands the output of another program?
 - Syntactic compliance(easy)
 - Semantic compliance(hard)

- Useful in interaction between two developers/programs:
 - How am i sure that a program understands the output of another program?
 - Syntactic compliance(easy)
 - Semantic compliance(hard)

Useful in high value applications (e.g. safety critical applications, security critical applications) - Largely solved

- Useful in interaction between two developers/programs:
 - How am i sure that a program understands the output of another program?
 - Syntactic compliance(easy)
 - Semantic compliance(hard)

- Useful in high value applications (e.g. safety critical applications, security critical applications) - Largely solved
- Useful anytime you need system interoperability(e.g. Web applications, Web services) - Largely unsolved because of unpredictable open world, like in the Web.

 Useful to build intelligent programs capable of autonomous reasoning(e.g. expert systems, decision support systems, Artificial Intelligence systems, intelligent software agents)

- Useful to build intelligent programs capable of autonomous reasoning(e.g. expert systems, decision support systems, Artificial Intelligence systems, intelligent software agents)
 - Explicit semantics allow to provide a formal/computational notion of (deductive) reasoning and to be guaranteed that the reasoning performed by programs is "correct" -Very hard

- Useful to build intelligent programs capable of autonomous reasoning(e.g. expert systems, decision support systems, Artificial Intelligence systems, intelligent software agents)
 - Explicit semantics allow to provide a formal/computational notion of (deductive) reasoning and to be guaranteed that the reasoning performed by programs is "correct" -Very hard

 Useful in next generation AI based computer systems. Goal is the integration of inductive reasoning(machine learning) and deductive reasoning(logical reasoning)

- Useful to build intelligent programs capable of autonomous reasoning(e.g. expert systems, decision support systems, Artificial Intelligence systems, intelligent software agents)
 - Explicit semantics allow to provide a formal/computational notion of (deductive) reasoning and to be guaranteed that the reasoning performed by programs is "correct" -Very hard

- Useful in next generation AI based computer systems. Goal is the integration of inductive reasoning (machine learning) and deductive reasoning (logical reasoning)
- Largely unsolved

1-Modeling

1.6-Using formal models



