

Concepts of programming languages

Prolog

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Terms

- ▶ building blocks of facts, rules, and queries.
- ▶ 4 kinds of terms:
 - ▶ atoms
 - ▶ numbers (both are called constants)
 - ▶ variables
 - ▶ complex terms



Either:

- ▶ string of characters..
- ▶ arbitrary string of ch. in " "
- ▶ string of special characters



Numbers

- ▶ Floats
- ▶ Integers
- ▶ Straightforward syntax



Variable

- ▶ starts with upper-case letter or _
- ▶ anonymous variable _



Complex term

- ▶ building block: functor
- ▶ nested functors make up complex terms



Examples



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Clauses

- ▶ Rules (clauses) state information that is conditionally true of the situation of interest.
- ▶ $\text{term1} \text{ :- term2}$
- ▶ term1 is true if term2 is true.



some Examples again

... —



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Unification (how it works)

Two terms unify if they are the same term or if they contain variables that can be uniformly instantiated with terms in such a way that the resulting terms are equal.



what this means??

...examples



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more on unification..

- ▶ two terms either unify or not
- ▶ if they unify, we are interested to know how the variables have to be instantiated to make the terms unify.



more precise rules:

Two terms (term1 and term2) unify:

- ▶ If they are both constants, they unify iff they are the same atom (or number)
- ▶ If term1 is a variable and term2 is any term, then they unify and term1 is instantiated to term2.
- ▶ If both terms are variables, they're both instantiated to each other.
- ▶ If both are complex terms and ... (next slide)
- ▶ Iff it follows from the rules above that they unify.



Some examples first



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Some examples first...



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If term1 and term2 are complex terms, they unify iff:

- ▶ they have the same functor and arity (nr. of args)
- ▶ all their corr. args unify
- ▶ the variable instantiations are compatible





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