Logical Programming.

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-Content:

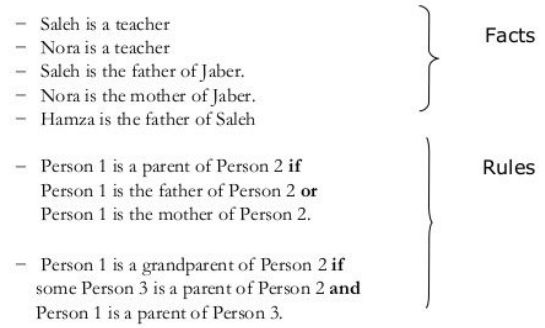
Prolog (Programmation in Logique-Francés). Prolog is an untyped language, it uses Horn clauses as basic instructions. Horn clauses contain a positive literal maximum, they are also classified as negative and definitive.

A logic is a language. It has syntax and semantics. More than a language, it has inference rules.

- Syntax: the rules about how to form formulas; this is usually the easy part of a logic.
- Semantics: about the meaning carried by the formulas, mainly in terms of logical consequences.
- Inference rules: describe correct ways to derive conclusions.

Programs are logic formulas of certain and Computations are logic inferences.

The Facts: they are specific and unconditional unitary, also known as knowledge base.
The rules: are general relations between the facts, represent restrictions that help to relate objects.
Example Database:



The logical programming paradigm is characterized by the use of facts and rules to represent information, in addition to the use of deductions to answer queries. Programmers provide the facts and rules. and the system provides the deduction mechanism, this is known as an inference engine.
Core items: Values, Lists, Strips, Expressions, Variables.

History of Logic Programming.

1. Formulated in 1974 by a professor at Univ. of Edinburg.
2. FIrst system implemented in 1995 by a research group in France.
3. First compiler built in 1997 by a PhD student also in First compiler built in 1997 by a PhD student also in Edinburgh. Edinburgh. z Japan's fifth generation computer project s fifth generation computer project announced in 1980. announced in 1980. z Efficiency improved in recent years Efficiency improved in recent years z Interfaces with other languages such as C/Java.

Why Prolog is not as popular as C/Java?

1. Mistaken at first as some universal computer language
2. Not yet as efficient as C
3. Support to Prolog takes effort, resources; companies are not willing to pay for it.
4. Its value not recognized by industry

The predicate Cut "!" It is a predefined predicate. Its common uses are:

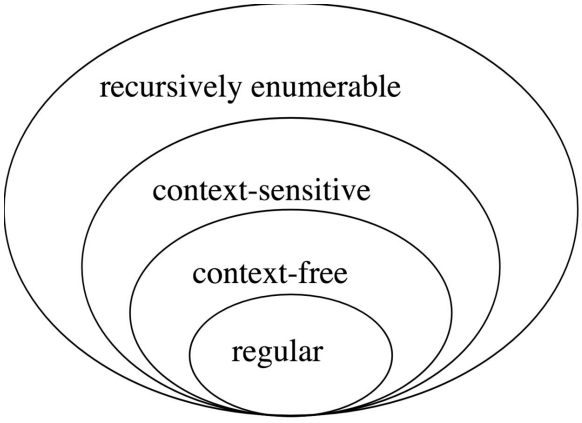
1. Get a single solution.
2. Do not look for solutions in alternative predicates.
3. Combination of cut and failure.

Natural language:

- It refers to a restricted form of human language.
- Basically the task of processing the language consists of three phases:
    - Lexical Analysis
    - Syntactic Analysis
    - Semantic Analysis
- A language can be seen as a set of sentences of finite length.
- Each phrase is composed of symbols of some alphabet, according to a certain combination to form correct sentences.
- To specify how to build correct sentences in any language, use as formalism the grammars, which constitute a set of rules that define the structure of a language

Context-free grammar [BNF]

- A grammar is said to be context free if its constituents are structurally mutually independent, that is the structure of one part does not influence the structure of another part.
- The problem of building a tree is called an analyzer.
- The problem of analyzing the sentence is called parser.



Expert systems

An expert system is a program that behaves like an expert for some application domain, normally reduced. Must be able to explain decisions that has been taking and the underlying reasoning.

- Parts of an Expert System
  - Knowledge base
  - Inference engine [Prolog]
  - User interface
- Characteristics of an Expert System
  - Modular: each rule defines a small part of the small knowledge and relatively independent.
  - Incremental: New rules can be added to the knowledge base, They are relatively independent of the other rules.
  - Modifiable: You can change the rules for new ones.
  - Transparent: It is able to explain the decisions made and the raised solutions.