Language

Thomas de Grivel thoxdg@gmail.com

https://kmx.io/

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Section 1

Language

Subsection 1

Structure

Three components

Any formal language usable with a model is composed of three things :

- A schema (or grammar)
- Semantics
- Data

Schema

In model theory a schema allows you to define an ontology, that is a definition of what can and cannot be expressed in your language.

It is the shape of your language, the rules on the sequence of letters and words that are part of the language or not.

The most used schemas for language definition are grammars.

Is there a grammar for each possible schema ?

Semantics

Semantics tell you the meaning of the language. They describe how to translate your language into another one.

This is a relative process : a semantic is from a language to another, even if it is the same language acting as source and destination language.

Semantics give meaning to your language which otherwise is just another data model.

A number of programming languages also export the semantics of lower-level constructs such as mathematical operations from the processor or disk access from the kernel.

Data

Data is valid use of the language for reasons pertaining to its semantics.

It is a direct application of the language schema.

The data of the language is directed by the semantics of the language.

Usually the schema of the language has an entropy of orders of magnitude higher than the available storage space for the language data.

Data is a choice from the possibilities of the language schema driven by the semantics of the language.