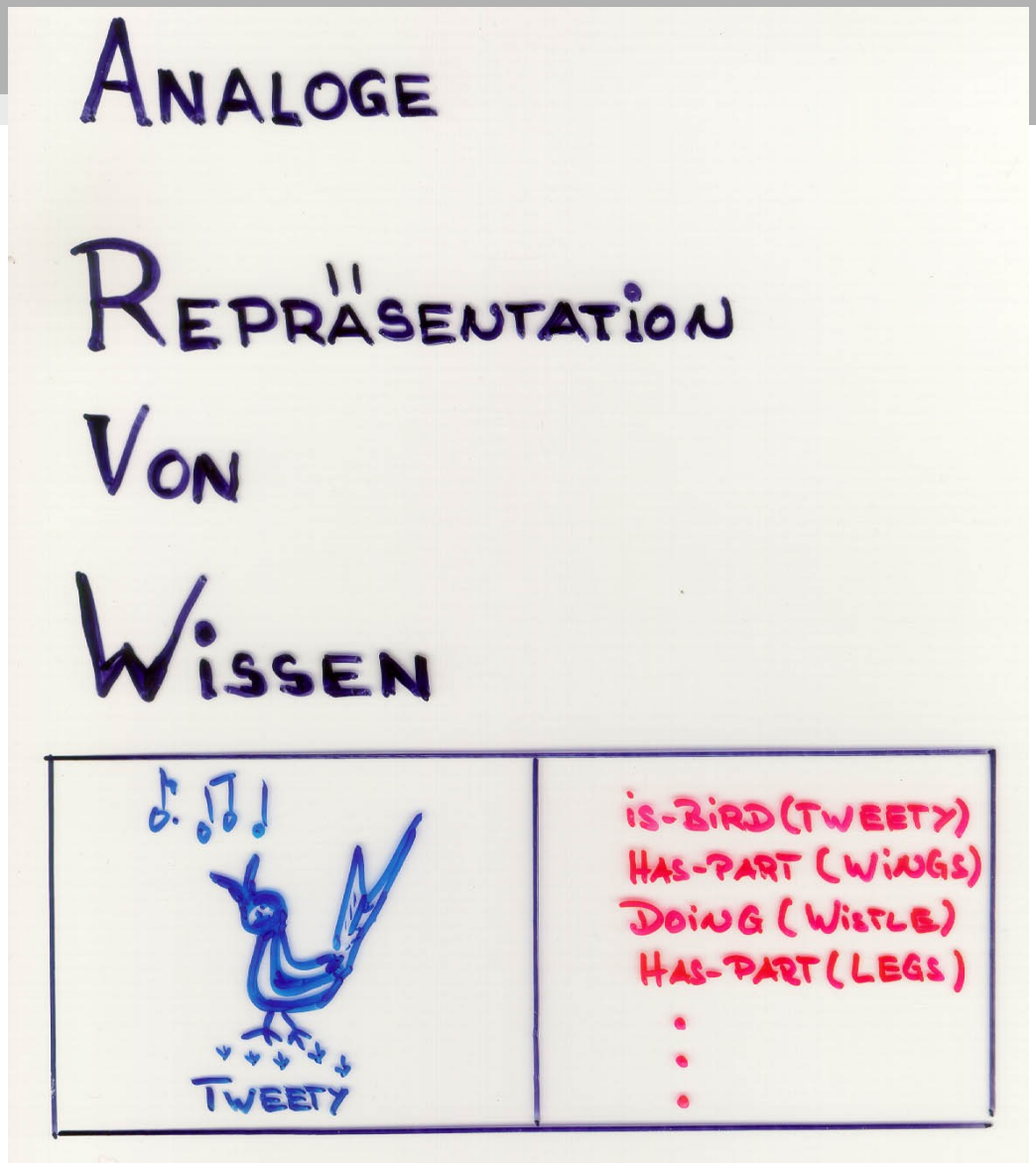

EXCURSION:

Analogue Representation

Aaron Sloman,
Sussex and Birmingham

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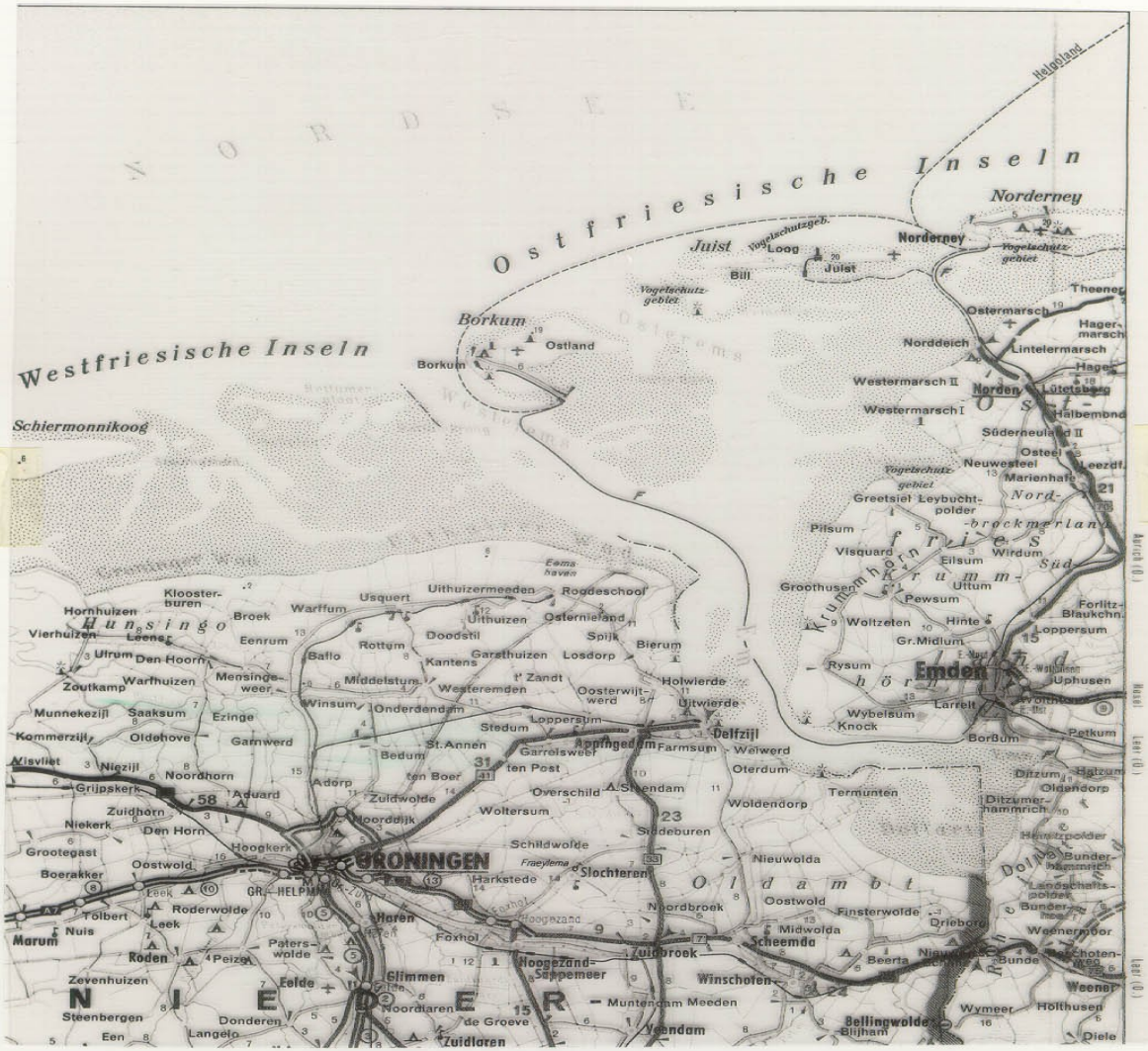
Beispiel: Analoge Repⁿ

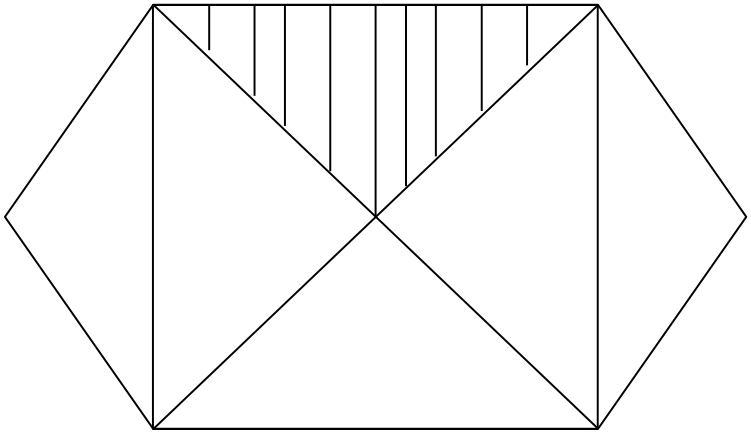


Kognitive Adäquatheit?

A Map :

Declarative or analogue?

Analogue Rep^{n} plus Reasoning



Pythagoras`
Theorem

Schopenhauer: “The World as intention and imagination"

“Die Welt als Wille und Vorstellung"

What‘s the Difference ?

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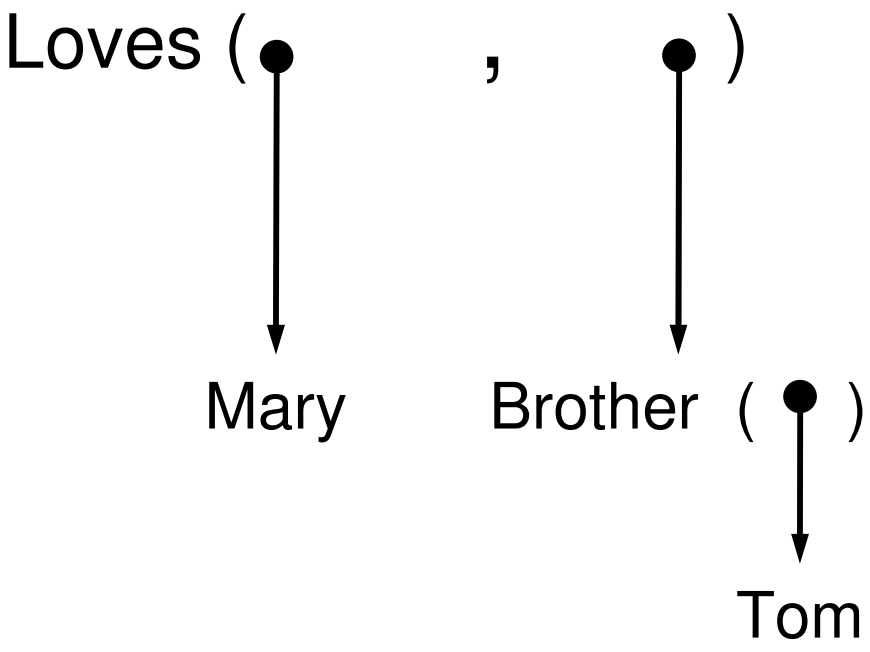
Fregian Representation:
Functional and Declarative

" Mary loves Tom's brother "



Gottlob Frege:
Begriffsschrift
(Halle 1879)

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Examples for Fregian Representations

Arithmetical Expressions:

$$\frac{(X + Y)^3}{(X - Y)^2}$$

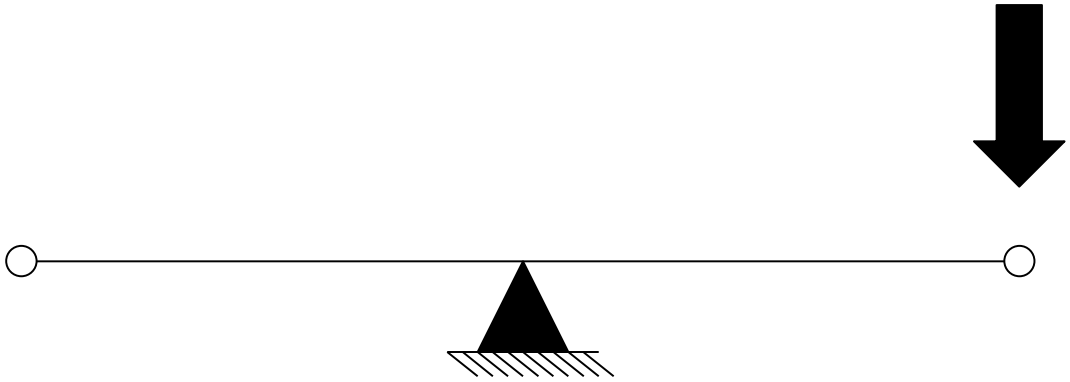
Logical Expressions:

$$\exists z \,.\, \forall x \,.\, \mathrm{P}\, x \wedge Q x \Rightarrow \sim R \times z$$

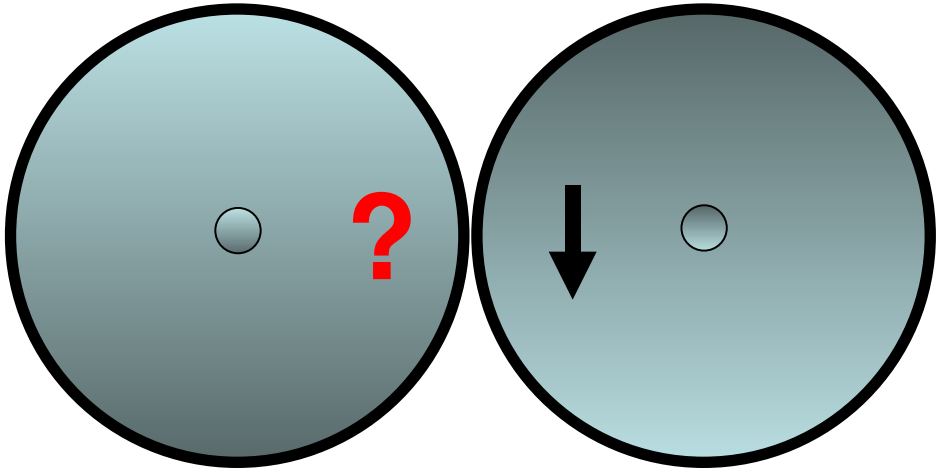
Programming Languages:

LISP: cons(car(list), cdr(list)) = list

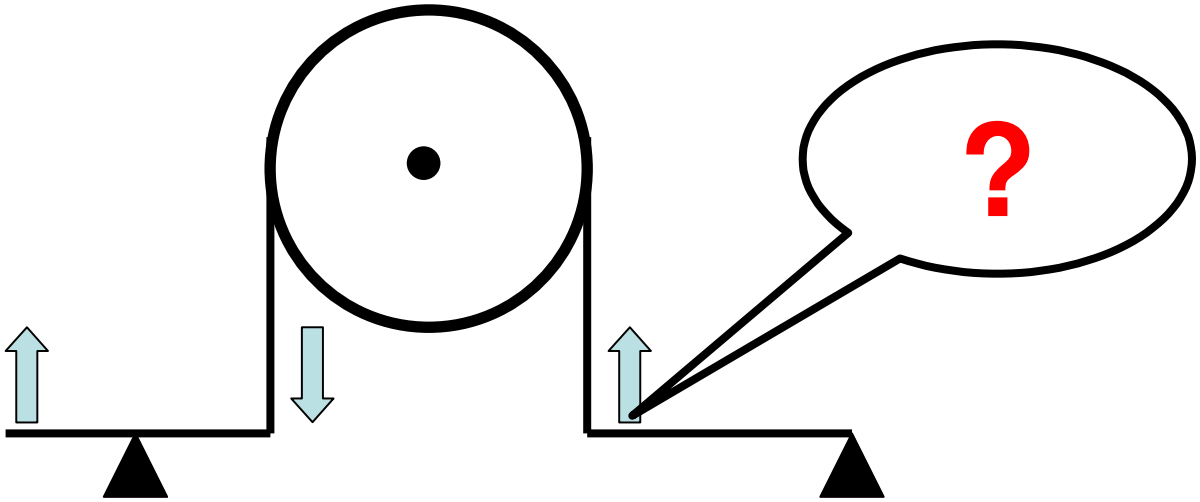
Example: Analogue Repⁿ (1)



Example: Analogue Rep^{n} (2)



Example: Analogue Repⁿ (3)



Example: Analogue Repⁿ (4)

|| + ||| = |||||

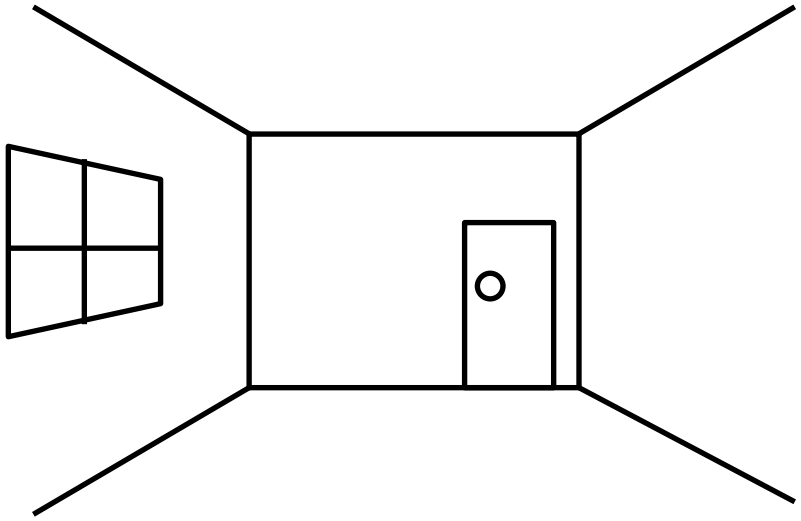
|||| - || = ||

More Examples: Analogue Rep^{n}

- Call Structure
- Cable Plans
- Computer Boards
- Photography / Painting
- etc . . . . .
- Computer Vision (?)

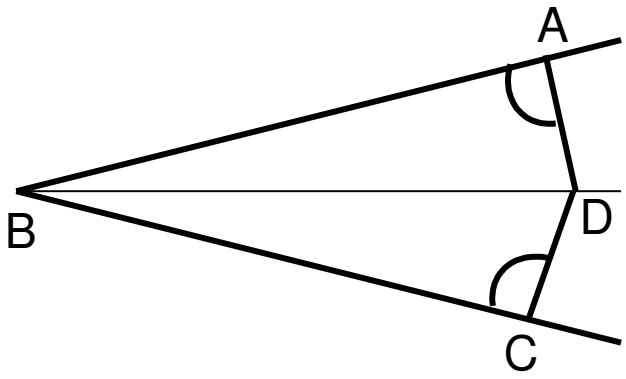
Again: What is the difference ?

- Implementation of a Representation
- Isomorphism
- Relationship of the Parts to the Whole



Analogue Rep^{n} of Knowledge in AI

Example:



$$\sphericalangle ABD = \sphericalangle DBC$$

$$\Rightarrow \overline{AD} = \overline{DC}$$

In: Gelernter's Geometry Theorem Prover

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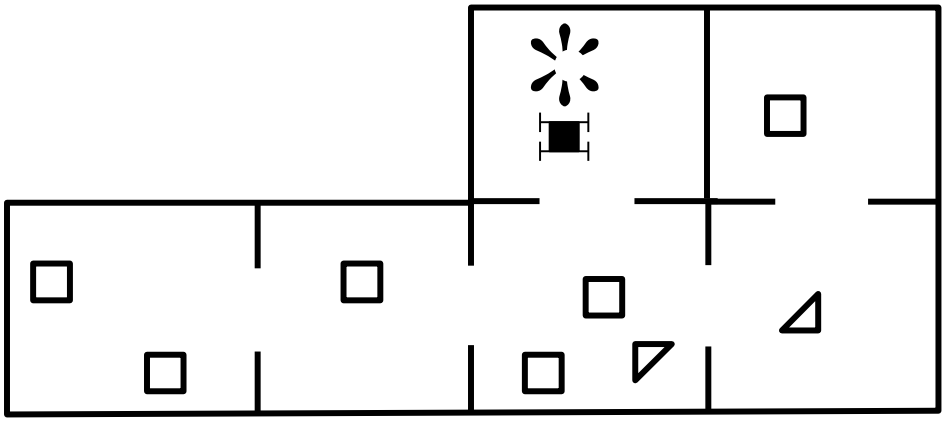
Analogue Rep^{n} of Knowledge in AI

Example:



In: Shakey's Representation of the World

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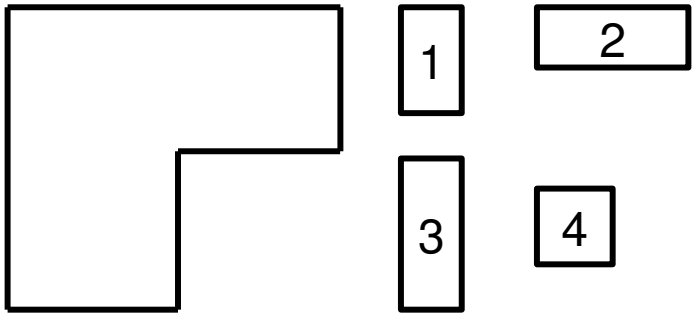
Analogue Rep^{n} of Knowledge in AI

Example:

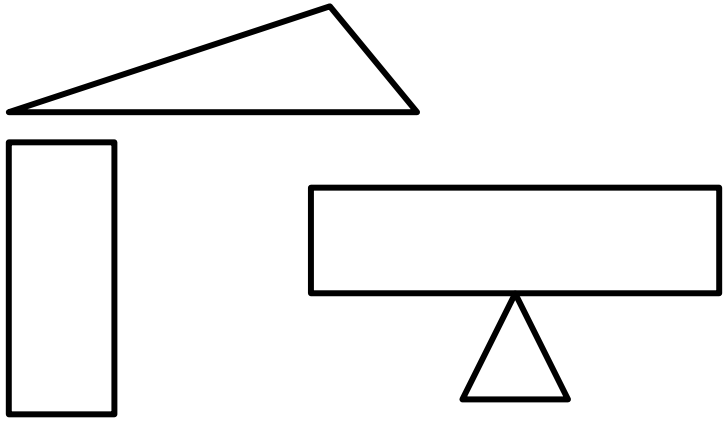


“Subject to Constraints "

In: Estman‘s General Space Planner

Analogue Rep^{n} of Knowledge in AI

Example:



In: Funt`s „Whisper“-Programme

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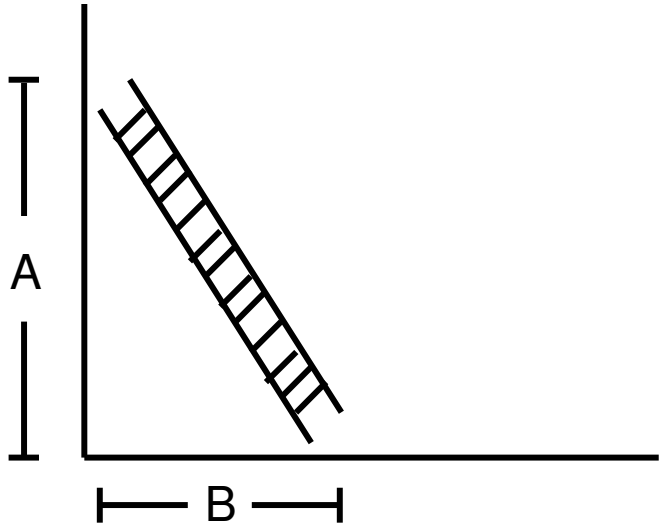
Analogue Rep^{n} of Knowledge in AI

Example: *Will the ladder slip away?*



Given:

- A / B
- Weight
- Frictional Coefficient

In: A. Bundy: ' Mecho '

Analogue Rep^{n} or Freges‘ Rep^{n} ?

? What is better ?

- Exists a denotiation ?
- Changes in representation ≡ changes in the represented object ?
- Explicit versus implicit constraints
- Number of relations

? What do we use ?