

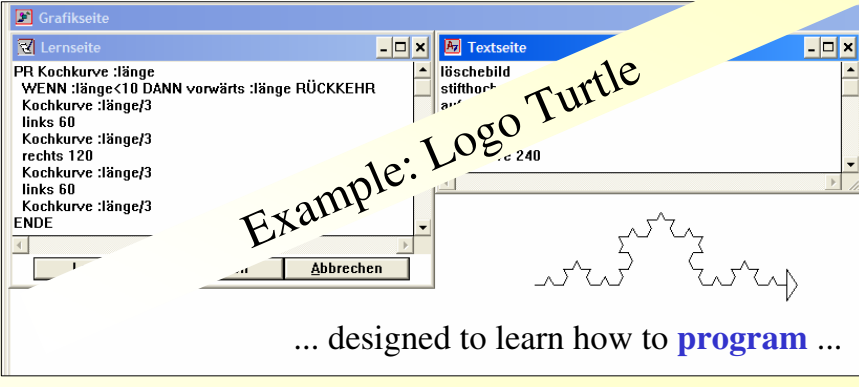
Standard Software as Microworld?

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Microworld?

... a **learning** environment ...



The screenshot shows a graphical user interface for the Logo Turtle programming language. On the left, a window titled 'Lernseite' contains the following code:


```
PR Kochkurve :länge
WENN :länge<10 DANN vorwärts :länge RÜCKKEHR
Kochkurve :länge/3
links 60
Kochkurve :länge/3
rechts 120
Kochkurve :länge/3
links 60
Kochkurve :länge/3
ENDE
```

 Below the code is an 'Abbrechen' button. On the right, a window titled 'Textseite' shows a drawing of a Koch curve, a fractal shape. A yellow diagonal banner across the image reads 'Example: Logo Turtle'. Below the screenshot, the text reads:

... designed to learn how to **program** ...

Programming?

... stands for

- problem solving
 - structured decomposition and recomposition
 - formalization
 - automation

⇒ (representative for)

fundamental concepts of informatics

Microworld!

(re-) definition:

A Microworld should be understood as an

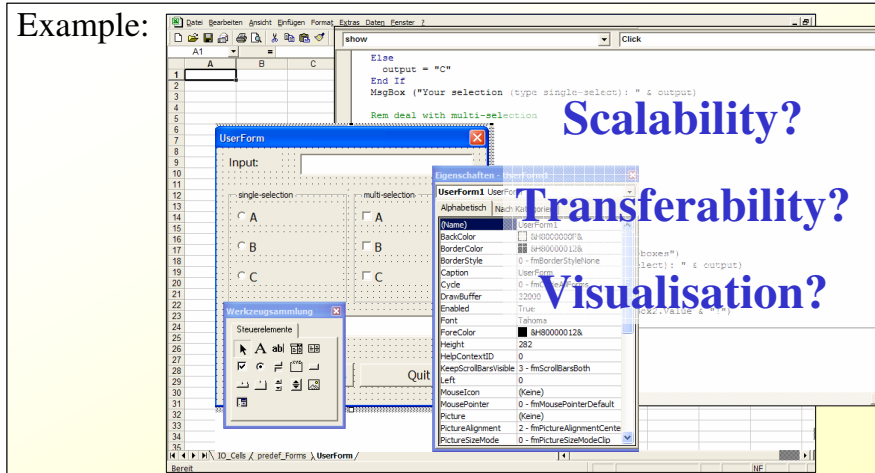
adaptable „learning-cosmos“

that is consistent to the learners and stands out for

- **Scalability**
- **Transferability**
- ability to **Visualise**

Standard Software?

Example:



Scalability?
Transferability?
Visualisation?

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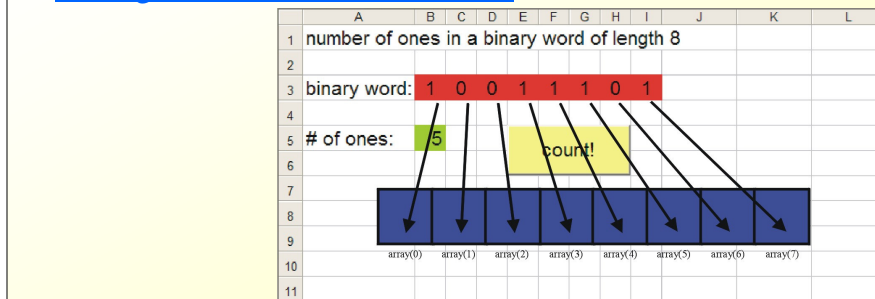
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Standard Software! (1)

Structural Scalability:

- [scaling input and output](#)
- [scaling »abstract data structures«](#)



	A	B	C	D	E	F	G	H	I	J	K	L
1	number of ones in a binary word of length 8											
2												
3	binary word: 1 0 0 1 1 1 0 1											
4												
5	# of ones: 5											
6	count!											
7												
8	array(0) array(1) array(2) array(3) array(4) array(5) array(6) array(7)											
9												
10												
11												

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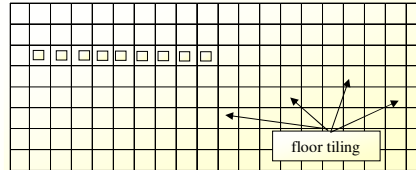
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Standard Software! (2)

Methodical Scalability



Stimulus: »How many pieces of chalk are on the floor«?



answer: 9 (»obviously«!?)

Question 1: How can you decide?

Question 2: How do you proceed on counting?

Question 3: Imagine (i.e. **change your perspective**) you are that small that you can only tell about the tile you are on. How do you count now?

Aufgabe 4: Draw a flowchart that pictures your answer to question 3.

Aufgabe 5: The chalk pieces are arranged so that they form a special »structure« (»pattern«, »order«) that can be used on counting. Describe this »structure«! What would it mean to counting, if the pieces were arranged in different order, i.e. forming a different structure (which other structures can you think of?), what if there were no structure at all (i.e. if the pieces were arranged randomly)?

*on each tile there shall be one piece of chalk at the most

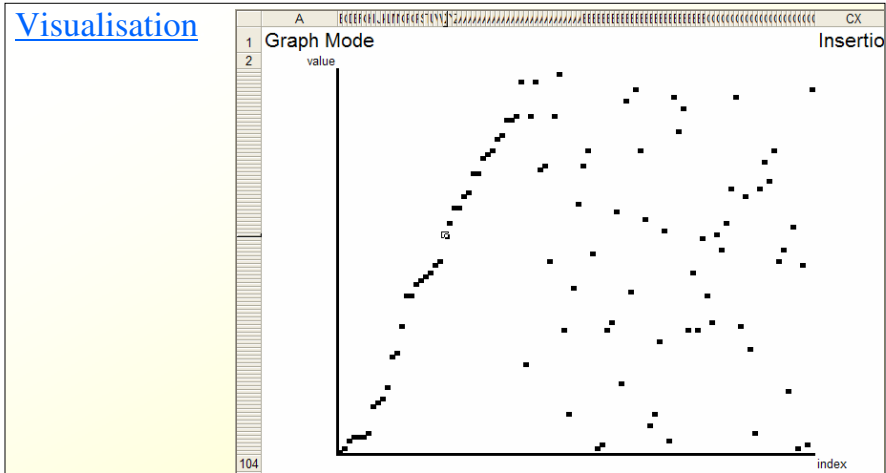
Standard Software! (3)

Curricular Scalability:

... i.e. **reusability** of software-tools

- ... introducing basic (**transferable**) programming-principles
- ... developing event-triggered programs
- ... getting in touch with objects
- ... using tables as data-sources
- ... solving application-oriented problems
- ...

Standard Software! (4)



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Importance?

The »collection«

- **Scalability**
- **Transferability**
- **ability to Visualise**
- **(Applicability)**

... might be a step towards a list of criteria being

helpful in **deciding the relevance of software-tools**

for teaching informatics.

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