Formal Concept Analysis
I Contexts, Concepts, and Concept Lattices

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Agenda

1. Concept Lattices
   - What is a concept?

What is a concept?

Homework from last week

Read the following works about concepts and conceptual modelling

- http://www.alleydog.com/glossary/definition.php?term=Concept
- http://general-psychology.weebly.com/how-are-concepts-formed.html
- Walter Edelmann *Lernpsychologie*, 6. Auflage, 2000. Kapitel 4.2 (Seiten 116-130, insbesondere Kapitel 4.2.1 zu "Eigenschaftsbegriffen" und "klassischer Theorie")

Identify the most important and common ideas and concepts and write them down. You need them in the next lecture, where we will try to mathematically formalize the concept of "concept".

What is a concept?

Now: $\approx$ 45 minutes of interaction

1. group work: formalizing the concept of a "concept"
2. plenary discussion: exchange of ideas
3. group work: application of the formalization
4. plenary discussion: consolidation

What is a concept?

1. group work: formalizing the concept of a "concept"

- small groups (3-4 students), 10 minutes
- tasks
    1. decide *who makes notes* and *who will discuss* in the next phase
    2. *exchange your thoughts* about "concepts" based on the texts
    3. come up with a *formal definition* of a concept
    4. describe *exemplary concepts* in the field of water bodies
- result: poster

What is a concept?

2. plenary discussion: exchange of ideas

- every group briefly presents results using the poster

What is a concept?

3. group work: application of the formalization

- small groups (3-4 students), 10 minutes
- given the following dataset (called a "formal context")
    1. find concepts according to your definition
    2. find sub-/superconcepts
    3. check, if your definition works, if not, adopt it

	groß	klein	natürlich	künstlich	fließend	stehend
Fluß	×		×		×	
Bach		×	×		×	
Kanal	×			×	×	
Graben		×		×	×	
See	×		×			×
Tümpel		×	×			×
Teich	×			×		×
Becken		×		×		×

What is a concept?

4. plenary discussion: consolidation

- discuss results
- Which definition worked, which not?
- What have you learned?
- discuss definition from Ganter & Wille