Physics Lecture

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1 Passing

There will be 2 exams / tests. There will be weekly lists of tasks to do for Exercises.

2 Curriculum

- 1/3 of the course is basic logic formulas, useful for simplifying if-else comparisons
- 1/3 will cover information what will be helpful to courses on databases, machine learning & artificial intelligence
- 1/3 will cover details on semantics that will be useful on the masters level

3 What is logic?

- Logic is defined as formal apparatus for reasoning.
- There are two elements:
  - Formal language - a set of sentences built with symbols
  - Semantics - a method of adding meaning to them

4 Sentences in logic

- Basic symbols, variables: a,b,c
- Logical connectives, operators:
  - OR (alternative, disjunction) $\vee$

- AND (conjunction) $\wedge$
- NOT (negation) $\neg$
- IF ... THEN (implication) $\implies$
- TRUE IF AND ONLY IF $\iff$
- Tautology $\top$

5 Logic Laws

- $(a \wedge b) \vee c \equiv (a \vee c) \wedge (b \vee c)$
- $(a \vee b) \wedge c \equiv (a \wedge c) \vee (b \wedge c)$
- $\neg(a \vee b) \equiv \neg a \wedge \neg b$
- $\neg(a \wedge b) \equiv \neg a \vee \neg b$