2.17. Summary: Semantic Concepts

- Two sentences are **logically equivalent** when (and only when) they have the same truth tables (i.e., are true in the same valuations, and false in the same valuations).
- A sentence is a **tautology** (or **logical truth**) if it is true in every valuation.
- A sentence is a **contradiction** (or **logical falsehood**) if it is false in every valuation.
- A sentence is **consistent** (or **satisfiable**) if at least one valuation makes it true (**satisfies** it).

- A set of sentences is **consistent** (or **simultaneously satisfiable**) just in case at least one valuation makes every sentence in the set true (**simultaneously satisfies** all those sentences).
- A set of sentences is **inconsistent** (or **unsatisfiable**) if no valuation makes every sentence in the set true (simultaneously satisfies those sentences).

- **Consistency flows downhill, but not uphill**. That is: if from consistent set **S** a larger set **S+** is built by adding sentences, **S+** is not guaranteed to be consistent. But if from consistent set **S** a smaller set **S-** is built by throwing out some sentence(s), **S-** is guaranteed to be consistent.

- **Inconsistency flows uphill, but not downhill**. That is: beginning with inconsistent set **S**, adding further sentences to it yields a larger set **S+** guaranteed to be inconsistent. But if from inconsistent set **S** a smaller set **S-** is built by throwing some sentence(s) out of **S**, **S-** is not guaranteed to be inconsistent.