**Ch 3 - Boolean Connectives**

* to form complex claims, FOL has **connectives** and **quantifiers**
* simplest connectives
  + **conjunction** (and)
  + **disjunction** (or)
  + **negation** (it is not the case that)
* called **Boolean operators** or **Boolean connectives**, aka **truth-functional connectives**
  + truth-functional: truth value of a complex sentence built up using these connectives depends on nothing more than the truth values of the simpler sentences from which it is built
* **truth table:** table that shows how the truth value of a sentence formed with connectives depends on truth values of immediate parts
* **literal:** a sentence is a *literal*  if it is either atomic or the negation of an atomic sentence

**Conjunction Symbol**

* ∨ expresses **conjunction**, notion expressed in English with words *and, moreover,* and *but*

**Equivalences**

* **DeMorgan’s Laws**
  + **~(P & Q) iff ~P | ~Q**
  + **~(P | Q) iff ~P & ~Q**
* **Double Negation**
  + ~~P = P

**Truth Conditions**

* if two sentences are true in exactly the same circumstances, we say that they have the same **truth conditions**
* in other words, the sentences must have the same truth value in every world, not just a single world

**Translations**

* in order for a FOL sentence to be a good translation of an English sentence, it is sufficient that the two sentences have the same truth conditions
* thus, given any English sentence S, a good translation in FOL is any sentence S’ with the same truth conditions as S; this means any of the infinite possibilities
* some translations are better than others: easier to understand, for example