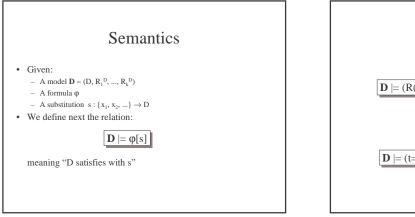
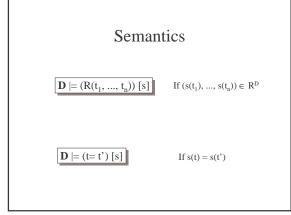
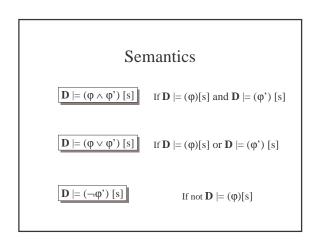


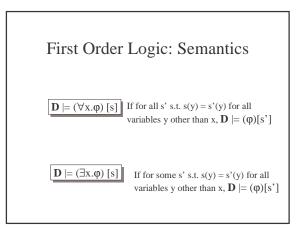


- Given a vocabulary $R_1, ..., R_k$
- A model is $\mathbf{D} = (D, R_1^{D}, ..., R_k^{D})$ - D = a set, called domain, or universe - $R_i^{D} \subseteq D \times D \times ... \times D$, (ar(R_i) times) i = 1,...,k









FO and Databases

- FO:
 a sentence φ is *true* in **D** if **D** |= φ
- Databases: a formula ϕ with free variables $x_1, ..., x_n$ defines the query: $\phi(\mathbf{D}) = \{(s(x_1), ..., s(x_n)) \mid \mathbf{D} \models \phi[s]\}$