

Objects, Assumptions and Stuff

- Closed World Assumption: only true statements are those given (derived)
- Domain Closure: all elements in domain are clearly stated
- Unique names: $(\text{name}_1 \neq \text{name}_2)$ means $(\text{thing}_1 \neq \text{thing}_2)$
- object symbols O , relation symbols R
- FACT: $r(O_1, O_2, \dots, O_n) \mid r \in R, O_i \in O$
- RULE: how new facts can be inferred from old ones
 - $\frac{(f_1, f_2, \dots, f_n) \Rightarrow f_{n+1}}{\text{if } f_i \text{ are true} \quad \boxed{\text{then}} \text{ this fact is true}}$
body head
- $\text{Var}(f) \subseteq \text{var}(f_1) \cup \dots \cup \text{var}(f_n)$
 - ↓ MUST appear in premises
- ∴ domain closure, rule has fixed number of ground instances
- RECURSIVE RULES: an example

$$\text{parent}(A, B) \Rightarrow \text{ancestor}(A, B)$$

$$\therefore \text{parent}(A, C) + \text{ancestor}(C, B) \Rightarrow \text{ancestor}(A, B)$$

- parent(x, y), parent(x, z) \Rightarrow sibling(y, z)
- ① parent(y, A), parent(z, B) \Rightarrow cousin(A, B)
- we have UNIQUE NAME assumptions

- SEMANTICS: meaning of a knowledge base
- INTERPRETATION: function which assigns truth to symbols, rules and facts
- ① With Closed World Assumption: just ONE way of interpreting stuff
- Consistent Knowledge Bases: \exists (interpretation satisfying it)
- Consequences of KB's: fact $F \models H$ (interpretations that satisfy c_{KB}
also satisfy F)
- $\therefore KB \models F$

→ Must ensure our KB is SENSIBLE, otherwise we could say this:

$$\text{potato}(\text{Suf}) \quad \text{potato}(X) \Rightarrow \text{weeb}(X) \\ \therefore \text{weeb}(\text{Suf})$$