

Next Chapter (3)

Logic

(function)

Prop. Logic (ch 2):
woefully
inadequatefor some
turns (KK)

Sep 13-2:00 PM

First-Order
Logic (FOL)(Quantificational
logic;Predicate logic)
(Vast extension
of Prop Logic)

Sep 13-2:08 PM

K&K:

Person says something.

Prop
Logic { KB: B is a knight
S: B says "..."Need symbols for objects,
and for properties or
predicates

Sep 13-2:10 PM

Language of FOL:

① Pred. Symbols

 $P, Q, R, \dots$

② Object symbols

 $a, b, c, \dots$ $P(a)$: a has property
P. $K(b)$ R Says(b, u)

Sep 13-2:18 PM

Examples $K(a) \rightarrow \text{True}(u) ?$ $[K(a) \wedge \text{Says}(a, u)]$ $\rightarrow \text{True}(u)$ $[K(a) \wedge S(a, "K")]$ $\rightarrow \text{KK}$

Sep 13-2:30 PM

③ Variables

 $x, y, z, \dots$ $K(x)$ $x^2 + 1 > 0$ $[K(x) \wedge \text{Says}(x, y)]$ $\rightarrow \text{True}(y)$ ④ quantifiers $\forall, \exists$

Sep 13-2:46 PM

$$\frac{\forall x \forall y [(Kx \wedge S(x,y)) \rightarrow \text{True}(y)]}{\exists x \exists y S(x,y)}$$

A FOL wff can
have many meanings.

Sep 13-2:53 PM

	PL	FOL
	P	$P(a)$
meaning	T F	property for P subset of some things <u>kind</u> (<u>domain</u>)

Sep 13-3:03 PM

Def. Given a FOL language,
an interpretation consists

- ① a domain D
- ② for each constant symbol c , an elt. of D (c 's "meaning")
- ③ for each pred. symbol, a property w.r.t. D .

Sep 13-3:08 PM

Tarski Worlds

$D = \{a \dots k\}$
 $R: m \neq 4$
 $R(b, a)$
 $\neg R(a, b)$

Sep 13-3:12 PM