

# THE SYNTAX OF PREDICATE LOGIC

- a. Aristotle is not Socrates

$$\neg a=s$$

*Aristotle is not equal to Socrates*

- b. Some man is Aristotle

$$\exists x ( \text{MAN}(x) \wedge x=a)$$

*There is an entity  $x$  such that  $x$  is a man and  $x$  is equal to Aristotle*

- c. Every wizard who is not Voldemort is mortal

$$\forall x ( (\text{WIZARD}(x) \wedge \neg x=v) \rightarrow \text{MORTAL}(x) )$$

*For every entity  $x$ , if  $x$  is a wizard and  $x$  is not equal to Voldemort, then  $x$  is mortal*

## TRANSLATION

- 1 Paul and Fred left home but Mary did not

Let  $L$  = left home,  $p$  = Paul,  $f$  = Fred,  $m$  = Mary

Translation:  $((L(p) \wedge L(f)) \wedge \neg L(m))$

Paul left home

$L(p)$

Fred left home

$L(f)$

Mary left home

$L(m)$

Mary didn't leave home

$\neg L(m)$

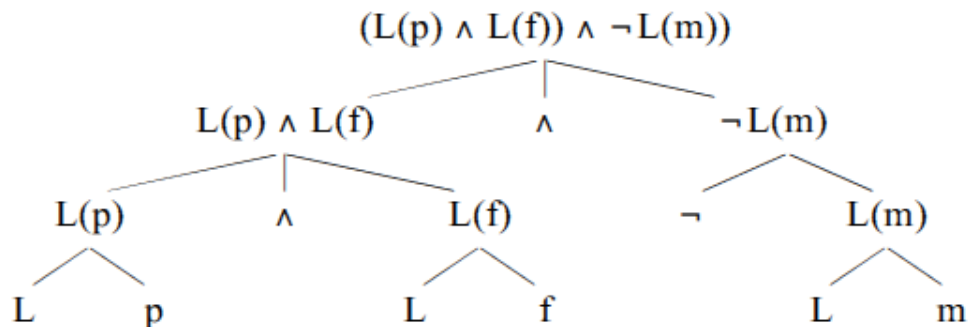
Paul and Fred left home

$(L(p) \wedge L(f))$

Paul and Fred left home but Mary did not

$((L(p) \wedge L(f)) \wedge \neg L(m))$

### Structure



2 Someone is sleeping

Let S = is sleeping, P = person

$\exists x (P(x) \wedge S(x))$

*There is some entity  $x$  such that  $x$  is a person and  $x$  is sleeping*

Structure

