## PH126 Logic I Lecture 12

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### **Quantifier Recap**

Everything is broken ∀x Broken(x)

All my things are broken  $\forall x \text{ (BelongsToMe}(x) \rightarrow \text{Broken}(x) \text{ )}$ 

Something is broken ∃x Broken(x)

Something of mine is broken ∃x ( BelongsToMe(x) ∧ Broken(x) )

## How to determine truth of a sentence with an existential quantifier as the main connective

- 1. Give every object a name.
- 2. For each name in turn, create a new sentence like this: delete the quantifier and replace all instances of the variable it binds with that name
- 3. If ANY OF the new sentences are true, so is the original.

# How to determine truth of a sentence with a universal quantifier as the main connective

- 1. Give every object a name.
- 2. For each name in turn, create a new sentence like this: delete the quantifier and replace all instances of the variable it binds with that name
- 3. If ALL OF the new sentences are true, so is the original.

### Multiple quantifiers

'There is a store for everything'

 $\exists y \forall x \ StoreFor(y,x)$ 

∀y∃x StoreFor(x,y)

Other sentences to translate:

'Wikipedia has an article about everything'

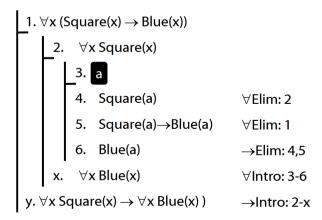
 $\hbox{`Everyone hurts someone they love'}$ 

'Someone hurts everyone she loves'

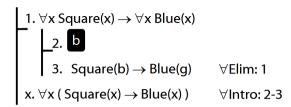
#### ∀Intro



## **∀Intro** Example proof



## Why is this proof incorrect?



## Intuitve summary of quantifier rules

∀Elim

If it's true of everything it's true of Baudrillard

#### ∃Intro

If it's true of Baudrillard it's true of something

#### ∃Elim

If it's true of something and Q follows no matter which something it is, then Q

#### ∀Intro

If it's true of an arbitrary thing, then it's true of everything.