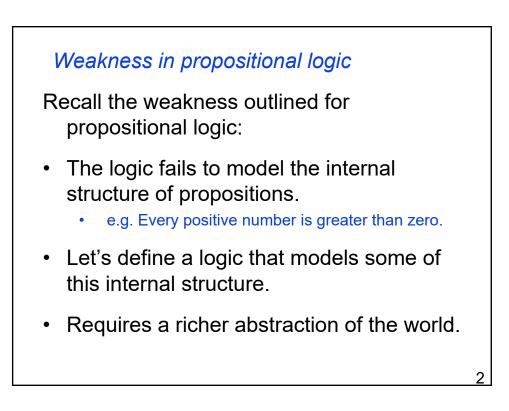
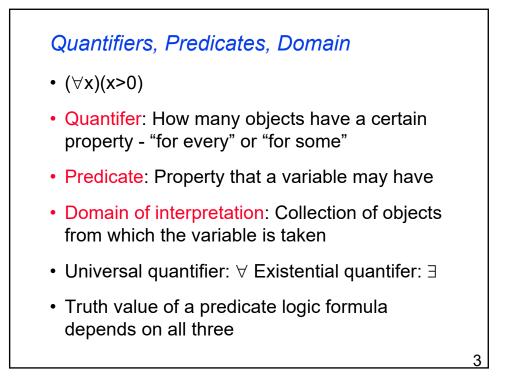
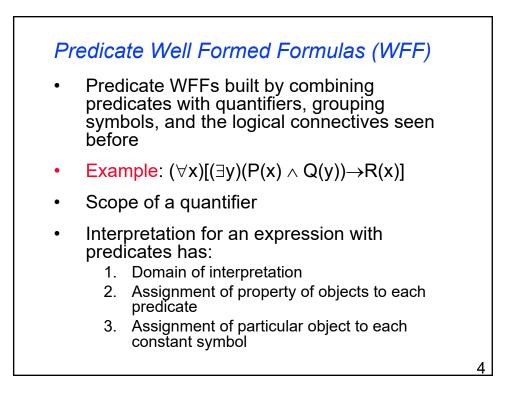
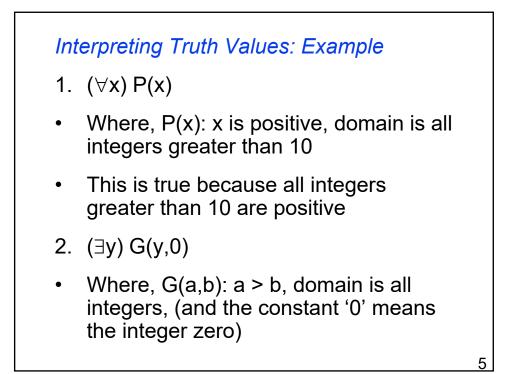
Outline

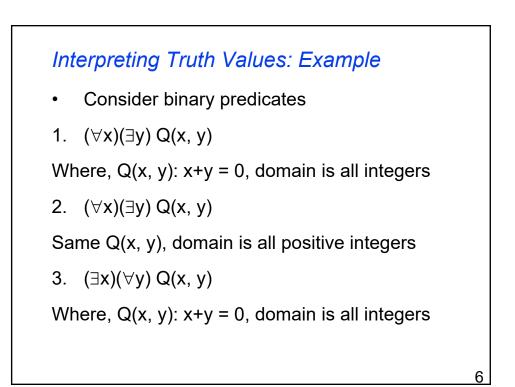
- Quantifiers and predicates
- Translation of English sentences
- Predicate formulas with single variable
- Predicate formulas involving multiple variables
- Negation of predicate formulas
- Text book chapter 1.3

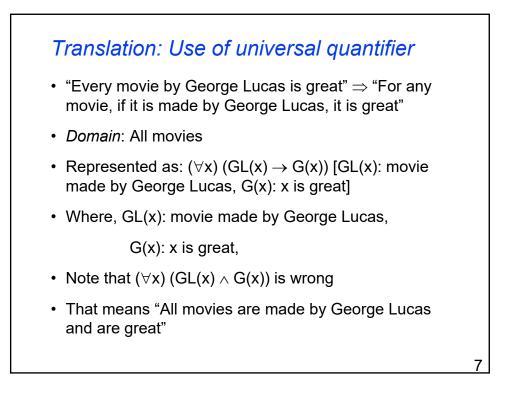


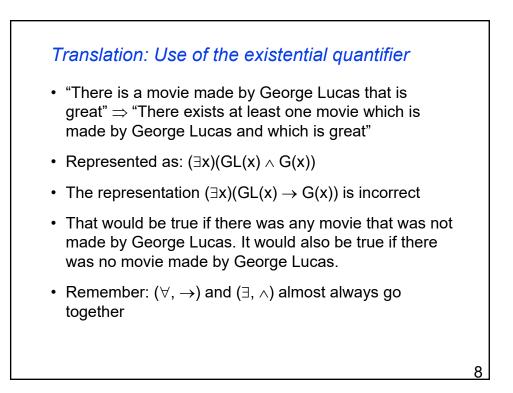


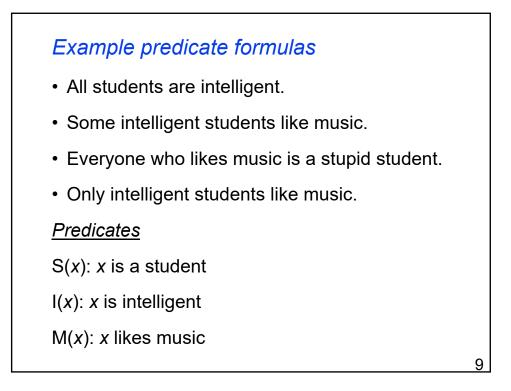


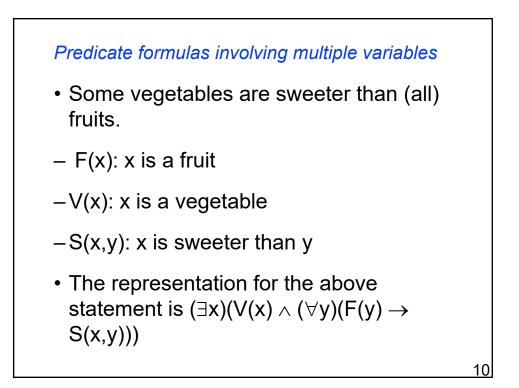


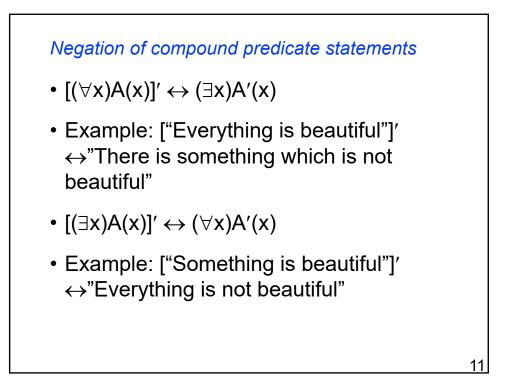


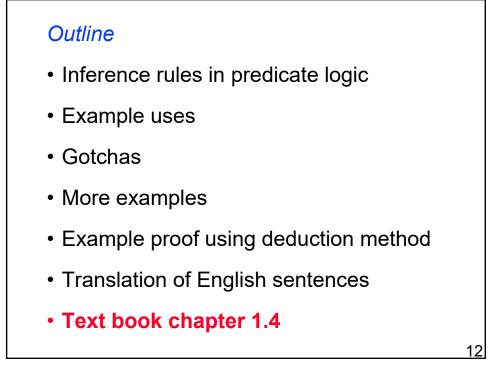


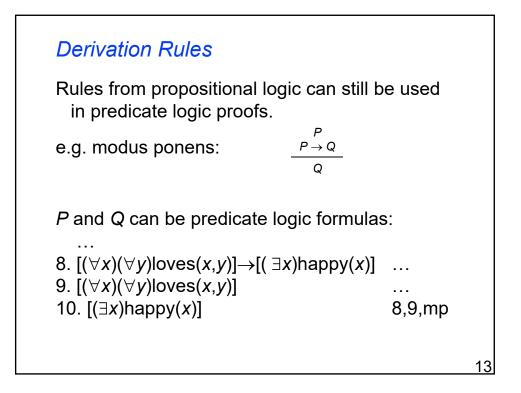




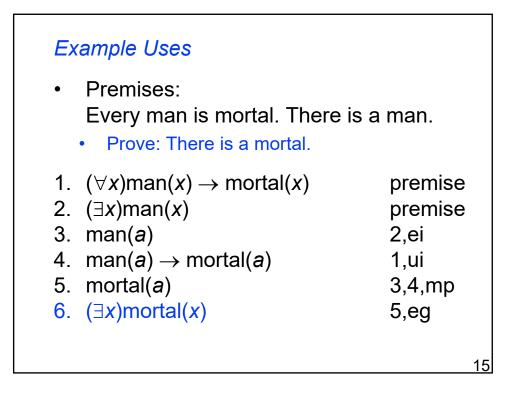


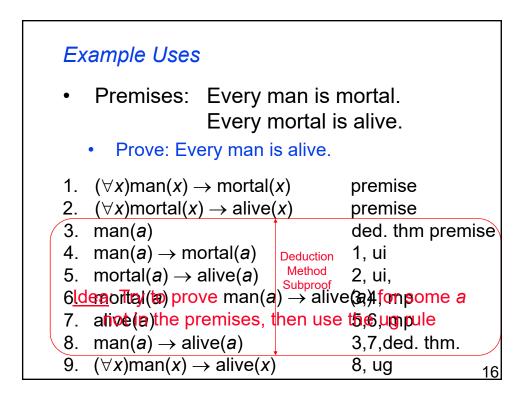


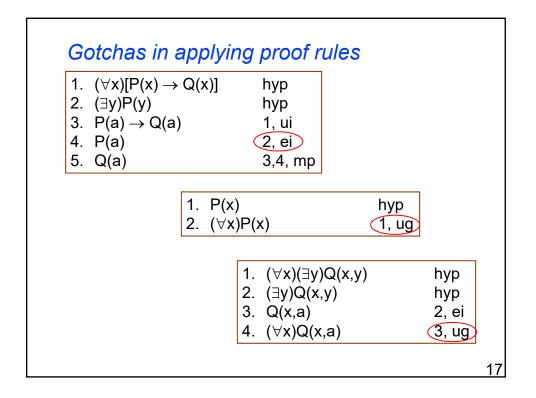


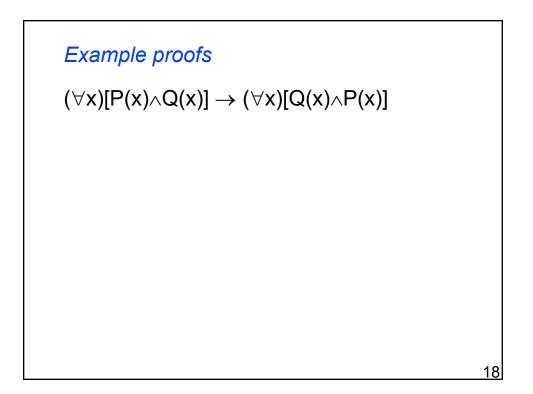


| Name & Abbrev | | If you have: | You may conclude: | When: |
|------------------------------|----|-------------------------------------|-------------------------------------|---|
| stential neralization | eg | P(a) | (∃ <i>x</i>) <i>P</i> (<i>x</i>) | x must not appear in P(a) |
| stential antiation | ei | (∃ <i>x</i>) <i>P</i> (<i>x</i>) | P(a) | Must be the first rule that introduces <i>a</i> |
| versal neralization | ug | P(x) | (∀ <i>x</i>) <i>P</i> (x) | 1. $P(x)$ not derived from a hyp with x as free variable 2. $P(x)$ not derived by e from wff with x as free variable |
| versal antiation | ui | (∀ <i>x</i>) <i>P</i> (<i>x</i>) | P(a) | <i>a</i> is a constant |









Example proof using deduction method $(\forall y)[P(x) \rightarrow Q(x,y)] \rightarrow [P(x) \rightarrow (\forall y)Q(x,y)]$



Every ECE student works harder than somebody, and everyone who works harder than any other person gets less sleep than that person. Maria is an ECE student. Therefore, Maria gets less sleep than someone.

Use E(x), W(x,y), S(x,y), m

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