

Quantifier tutorial

<http://www-rohan.sdsu.edu/~gawron/optimalitiy>

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2010-08-19

1 Introduction

2 Background ideas

- General principles

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Logical Form

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- A few simple rules to help the beginner get the hang of translating into logic

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 - Ambiguity of English

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 - 2 Arguments are in a consistent order

Connectives: Quantifiers, negation, and sentential

Universals (\forall), Existentials (\exists), and negation \sim correspond to appropriate English words, and each quantifier goes with its appropriate sentential connective:

every, all, any	\forall	\forall	\rightarrow	$\forall x \text{ dog}(x) \rightarrow \text{bark}(x)$
some, a, a certain	\exists	\exists	$\&$	$\exists x \text{ dog}(x) \& \text{bark}(x)$
not, n't	\sim	$\sim \exists$	$\&$	$\sim \exists x \text{ dog}(x) \& \text{bark}(x)$
no	$\sim \forall$			

Both avenues are broad.

$$|A \cap B| = 2 \quad |A| = 2$$

Between 5 and 10 airlines are bankrupt.

$$5 \leq |A \cap B| \leq 10$$

Every vs all

every must quantify over individuals. *All* seems to allow both quantification and reference to a group.

- All of these pieces fit together to make a picture.
- Every piece here fits together to make a picture. [? For every piece x , x piece fits together to make a picture.]
- The price of all these pieces is 20 dollars.
- The price of each piece is 20 dollars.