

Logic trees & Truth Tables

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Linguistics 525
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Outline

1 Introduction

Truth table: Complete example

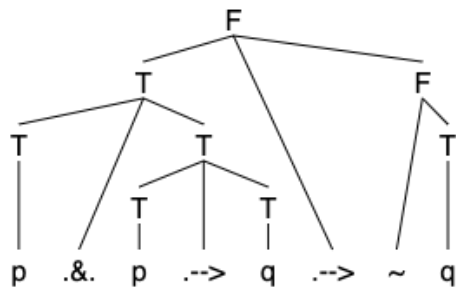
In these slides, we will go through all the steps for doing the truth table for:

$$(p \ \& \ (p \rightarrow q)) \rightarrow \sim q$$

We have 4 rows to fill.

p	q	$p \rightarrow q$	$p \ \& \ (p \rightarrow q)$	$\sim q$	$p \ \& \ (p \rightarrow q) \rightarrow \sim q$
T	T				
T	F				
F	T				
F	F				

Line one

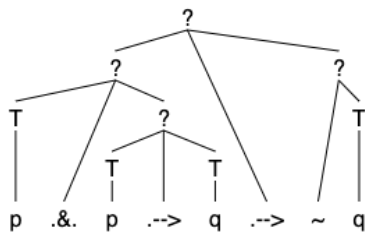


p	q	$p \& q$
T	T	T
T	F	F
F	T	F
F	F	F

p	$\sim p$
T	F
F	T

p	q	$p \rightarrow q$
T	T	T
T	F	F
F	T	T
F	F	T

Line one: Step by step

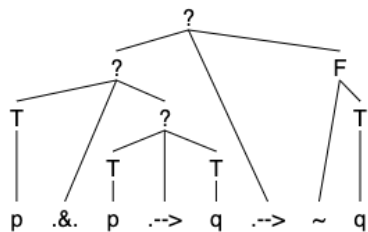


p	$\sim p$
T	F
F	T

p	q	p & q
T	T	T
T	F	F
F	T	F
F	F	F

p	q	p \rightarrow q
T	T	T
T	F	F
F	T	T
F	F	T

Line one: Step by step

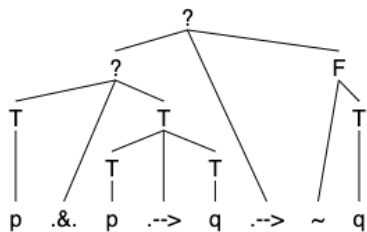


p	q	p & q
T	T	T
T	F	F
F	T	F
F	F	F

p	$\sim p$
T	F
F	T

p	q	p \rightarrow q
T	T	T
T	F	F
F	T	T
F	F	T

Line one: Step by step

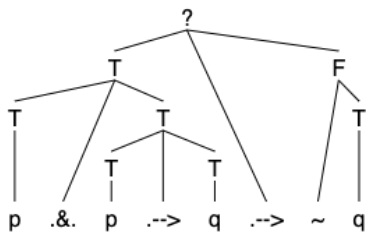


p	q	p & q
T	T	T
T	F	F
F	T	F
F	F	F

p	$\sim p$
T	F
F	T

p	q	p \rightarrow q
T	T	T
T	F	F
F	T	T
F	F	T

Line one: Step by step

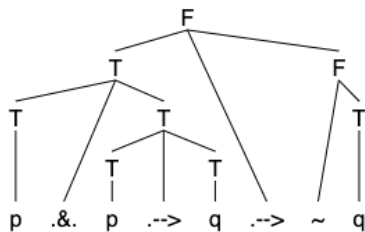


p	$\sim p$
T	F
F	T

p	q	$p \& q$
T	T	T
T	F	F
F	T	F
F	F	F

p	q	$p \rightarrow q$
T	T	T
T	F	F
F	T	T
F	F	T

Line one: Step by step



p	$\sim p$
T	F
F	T

p	q	$p \& q$
T	T	T
T	F	F
F	T	F
F	F	F

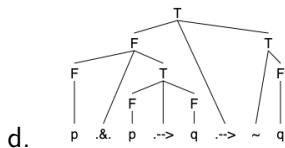
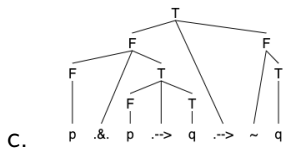
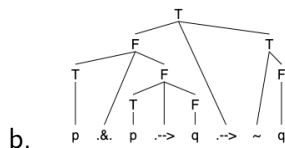
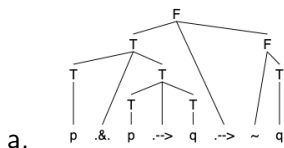
p	q	$p \rightarrow q$
T	T	T
T	F	F
F	T	T
F	F	T

Where we are so far

$$(p \& (p \rightarrow q)) \rightarrow \sim q$$

p	q	$p \rightarrow q$	$p \& (p \rightarrow q)$	$\sim q$	$p \& (p \rightarrow q) \rightarrow \sim q$
T	T	T	T	F	F
T	F	F	F	T	F
F	T	T	F	F	F
F	F	T	F	T	F

All the lines



	p	q	$p \rightarrow q$	$p \& (p \rightarrow q)$	$\sim q$	$(p \& (p \rightarrow q)) \rightarrow \sim q$
a.	T	T	T	T	F	F
b.	T	F	F	T	F	T
c.	F	T	T	F	F	T
d.	F	F	T	F	T	T