Section I.11: conth

Thursday, October 09, 2014 8:30 AM

p = 9

if p is true, then q must also be true
if p is felse, the law does not apply
if q is felse, then p must also be felse
in carit have p true and q felse
at the same time

example: True, If Pot sleeps in she will be late for class.

let p= "Pat cleeps in"
q= "Pat is late for class"

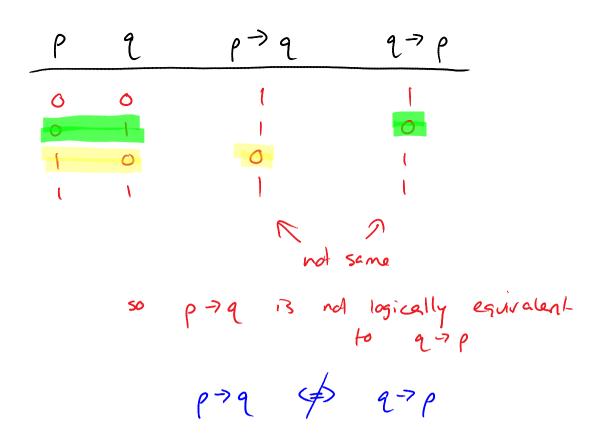
conditional: p -> q

If pag is true, is the converse gappalso true?

converse: If Pat is lake for class, then she slept in

no! not losically equivalent!

JUTH tables:



there are actually four of these:

conditional $p \rightarrow q$ converse $q \rightarrow p$ inverse $\bar{p} \rightarrow \bar{q}$ Contrapositive $\bar{q} \rightarrow \bar{p}$

example: For the conditional (p - 7q) below, write the corresponding contra positive $(\bar{q} - 7\bar{p})$.

"If Pet steeps in, then she is late for class."

of "If Pat is not lake for class, then Pat did not sleep in."

from kble:

P	9	ē	ē	p->9	q > p	ρ̄⇒q
0	0	ſ	1		1	t
O	1	(0		l l	O
-(0	0		0	0	t
(· ·	9	0	1	T	L
	Same					
	50 p→q (=> q→ p					

example: write the contrapositive $(\bar{q} \rightarrow \bar{p})$ for the following conditional $(\bar{p} \rightarrow \bar{q})$:

If I live in Saanich or Esquimalt then I live in BC.

=> If I do not live in BC, then I don't live in Seanich [AND] I don't live in Esquimelt.

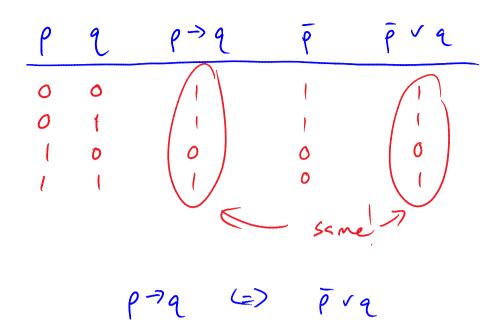
Conditional:
$$(p \vee q) \rightarrow \Gamma$$

Contraposition $\Gamma \rightarrow (p \vee q) \rightarrow \Gamma$

Contraposition $\Gamma \rightarrow (p \vee q) \rightarrow \Gamma$

Proposition $\Gamma \rightarrow (p \vee q) \rightarrow \Gamma$

the "or" form of the conditional:



example: write the or form (prq) of the conditional (p-7q):

If lat sleeps in, then she will be lake for class

=> Either lot did not sleep in or she will be lake for class or both.

Where do you see this in code?

pseudocode:

if x>3, then y=4
print y

question: if the altput is "4", was x>3?

consider

alp4: 4

$$x = 2$$

 $y = 4$
if $x > 3$ then $y = 4$
print y

appt: 4