

Slides for September 1 Quiz

September 2, 2017

Section 1: Truth Table for $(p \wedge (\neg q \vee p))$

p	q	$\neg q$	$(\neg q \vee p)$	$p \wedge (\neg q \vee p)$
T	T	F	T	T
T	F	T	T	T
F	T	F	F	F
F	F	T	T	F

The formula is satisfiable (because of occurrences of T in the rightmost column), but not a tautology (because of occurrences of F in the rightmost column).

A simpler equivalent formula is p .

Section 2: Truth Table for $p \vee (q \wedge \neg p)$

p	q	$\neg p$	$(q \wedge \neg p)$	$p \vee (q \wedge \neg p)$
T	T	F	F	T
T	F	F	F	T
F	T	T	T	T
F	F	T	F	F

The formula is satisfiable (because of occurrences of T in the rightmost column), but not a tautology (because of occurrences of F in the rightmost column).

A simpler equivalent formula is $p \vee q$.

How'd you do?

Great! The average score in Section 1 was 94%, and in Section 2 97%. In each section, the only question systematically answered wrong (by 12% of the students in Section 2 and by 30% in Section 1) was the last one, where you were asked to identify a simpler formula equivalent to the given one. In retrospect, I think that the Section 1 example, which has such a simple equivalent formula, is actually trickier, since it might seem odd that only one of the two input variables is involved.