

# Week 2 Recitation

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August 31, 2010

- (1 min max) Go over quiz from last week – we will not be doing interpolation.
- Questions about lecture / homework so far?
- Questions
  - Go over a question similar to Problem A of the homework “Suppose that  $a \wedge b$  is known to be true”. What is  $a \vee b$ ,  $a \rightarrow b$ . So,  $a = 1$ ,  $b = 1$ .  $a \vee b = 1$   $a \rightarrow b = 1$ . Draw truth table for  $a \rightarrow b$  and explain how to remember it (Rain analogy). A model for  $a \rightarrow b$  is  $a \leftarrow 0$ ,  $b \leftarrow 1$ ... and others...
  - Review SAT  $(a \vee b \vee \neg c \vee \neg d) \wedge (\neg b \vee c) \wedge (\neg a \vee c \vee d)$ , Term, Literal, Clause, Model.

$a$	$b$	$c$	$d$	$A : (a \vee b \vee \neg c \vee \neg d)$	$B : (\neg b \vee c)$	$C : (\neg a \vee c \vee d)$	$(A) \wedge (B) \wedge (C)$
0	0	0	0	1	1	1	1
0	0	0	1	1	1	1	1
0	0	1	0	1	1	1	1
0	0	1	1	0	1	1	0
0	1	0	0	1	0	1	0
0	1	0	1	1	0	1	0
0	1	1	0	1	1	1	1
0	1	1	1	1	1	1	1
1	0	0	0	1	1	0	0
1	0	0	1	1	1	1	1
1	0	1	0	1	1	1	1
1	0	1	1	1	1	1	1
1	1	0	0	1	0	0	0
1	1	0	1	1	0	1	0
1	1	1	0	1	1	1	1
1	1	1	1	1	1	1	1

- Go over 1.1:23 (a) in text. Let  $p$  be “It snows today”, let  $q$  be “I will ski tomorrow”. Converse is  $q \rightarrow p$ , Contrapositive is  $\neg q \rightarrow \neg p$  Inverse is  $\neg p \rightarrow \neg q$ . Converse “I will ski tomorrow only if it snows today”, Contrapositive “If I do not ski tomorrow then it will not have snowed today”, Inverse “If it does not snow today I will not ski tomorrow”

- Draw truth tables for all of these, what can we conclude about contrapositive?

$p$	$q$	$p \rightarrow q$	$q \rightarrow p$	$\neg p$	$\neg q$	$\neg q \rightarrow \neg p$	$\neg p \rightarrow \neg q$
0	0	1	1	1	1	1	1
0	1	1	0	1	0	1	0
1	0	0	1	0	1	0	1
1	1	1	1	0	0	1	1

- 1.1:7 f in text.  $(p \vee q) \wedge (p \rightarrow \neg q)$
- 1.1:33 (f) in text.

$p$	$q$	$r$	$A : \neg p \leftrightarrow \neg q$	$B : q \leftrightarrow r$	$A \leftrightarrow B$
0	0	0	1	1	1
0	0	1	1	0	0
0	1	0	0	0	1
0	1	1	0	1	0
1	0	0	0	1	0
1	0	1	0	0	1
1	1	0	1	0	0
1	1	1	1	1	1

- 1.1:13 (a) in text. Let  $p = 1 + 1 = 2$ , let  $q = 2 + 2 = 5$ .  $p \rightarrow q = 1 \rightarrow 0$  which is false.
- (Last 10 minutes) Give quiz