

CSE 311 Quiz Section 1: Apr 3, 2014

1 Introductions

Let's all introduce ourselves!

2 Student Questions

3 About Implication

Implication is one of the most fundamental concepts in logic, but can be unintuitive, as everyday English is often ambiguous. For example, consider the following propositional variables:

p : Chris gets a 3.0 in CSE 311

q : Chris passes CSE 311

The statement $p \rightarrow q$ is true. This means that "If Chris gets a 3.0, then Chris passes". However, the converse of this statement ($q \rightarrow p$: "If Chris passes, then Chris gets a 3.0") is not necessarily true. A true implication means that if the hypothesis of the statement is true, then the conclusion must be true. Therefore, an implication with a false hypothesis is always true.

4 Disjunctive Normal Form

From Chapter 1.3 in the 7th ed:

40. Find a compound proposition involving the propositional variables p , q , and r that is true when p and q are true and r is false, but is false otherwise.

41. Find a compound proposition involving the propositional variables p , q , and r that is true when exactly two of p , q , and r are true and false otherwise.

5 Knights and Knaves

You are on an island of knights and knaves. Knights always tell the truth and knaves always lie. You encounter two people, A and B . Determine, if possible, what the two people are:

1. A says "At least one of us is a knave" and B says nothing.
2. A says "The two of us are both knights" and B says " A is a knave"
3. A says "I am a knave or B is a knight" and B says nothing.
4. Both A and B say "I am a knight"
5. A says "We are both knaves" and B says nothing

6 Translating Implication Statements

Express each of these statements in the form “if p then q” in English.

1. It snows whenever the wind blows from the northeast.
2. The apple trees will bloom if it stays warm for a week.
3. That the Pistons win the championship implies that they beat the Lakers.
4. It is necessary to walk 8 miles to get to the top of Long’s Peak.
5. To get tenure as a professor, it is sufficient to be world-famous.
6. If you drive more than 400 miles, you will need to buy gasoline.
7. Your guarantee is good only if you bought your CD player less than 90 days ago.
8. Jan will go swimming unless the water is too cold.