Nirakar Shrestha

Artificial Intelligence

Professor Rosemina Vohra

October 26 2020

Assignment 7

Part 1. Which of the following are true or false? Explain why in 2-3 sentences.

a) True, because true can be entailed by any phrase or statement. In this example if a false statement is true then it is a true case.

b) False, because false can not be entailed by a true statement. If a true statement is true, false can never follow the true statement.

c) True, because the left-hand phrase is a subset of the right-hand phrase. So, if something is in both A and B it entails the biconditional relationship of A with B.

d) False, because to satisfy A ˅ B, because there is always a case where A ⇔ B does not have both A and B.

e) True, the phrase on the right-hand side is the same as A implying to B, and it can be entailed from a condition where A is biconditional to B.

f) True, because the left-hand side and right-hand side result in the same sets of answers. A implies C or B implies C can be entailed by a set produced by A and B entailing C.

g) True, because this satisfies the distributive property.

h) True, because A ˅ B is a subset of A ˅ B ^ something\* where something could be anything.

i) False, because there is disjunction in both sides which tend to decrease the size of a set and hence the case will most likely be false.

j) True, if the model consists of a set with A and negation of B then the statement will turn out to be true. Since one such condition exists, it is true.

k) True, because the left-hand phrase entails the right-hand phrase.

l) True, because all three have the same number of models and hence, A ⇔ B has the same model as (A ⇔ B) ⇔ C.

Part 2. Which of the following are true or false? Explain why in 2-3 sentences.

a) True, because something that implies itself is always true. In this case, smoke implies smoke itself, which is true.

b) False, because there is no enough evidence that the smoke is caused by a fire. The smoke could be coming from an electrical device.

c) False, because it is almost the same as the above case. It can be simplified as a statement if there is smoke from fire then there is no smoke from no fire which is not correct.

d) True, because there is always a case where there is fire or no fire and/or smoke (‘or smoke’ in this case).

e) True, because both sides of the phrase mean the same thing. So, they are biconditional.

f) True, because the case can be re-written as false => true which is true. Smoke implies fire is false and smoke and heat implies fire is true.

g) True, because the third part of the phrase translates to a true if not big. So there is always a case where something is big or not big and/or dumb (‘or dumb’ in this case).