Solution to Homework 21

Question. Suppose that our degree of confidence in a statement A is 0.8, in a statement B is 0.7, and in a statement C is 0.6. Suppose that we use min as "and" and max as "or". What is our estimate for the degree of confidence in a composite statement $A \,\&\, (B \vee \neg C)$?

Answer. In general, the desired degree is equal to $d = f_{\&}(a, f_{\vee}(b, f_{\neg}(c)))$, where al b, and c are our degrees of confidence in statements A, B, and C. For $f_{\neg}(x) = 1 - x$ and for our choice of "and"- and "or"-operations, we have $d = \min(a, \max(b, 1 - c))$. For given degrees of confidence a, b, and c, we get

$$d = \min(0.8, \max(0.1, 1 - 0.6)) = \min(0.8, \max(0.7, 0.4)) = \min(0.8, 0.7) = 0.7.$$