

1705026

COURSE: DISCRETE MATHEMATICS

SOLVING_STUDENT_ID: 1705026

VERIFYING_STUDENT_ID: 1705107

Problem:

Ex. no: 46

Question:

Fuzzy logic is used in artificial intelligence. In fuzzy logic, a proposition has a truth value that is a number between 0 and 1, inclusive. A proposition with a truth value of 0 is false and one with a truth value of 1 is true. Truth values that are between 0 and 1 indicate varying degrees of truth. For instance, the truth value 0.8 can be assigned to the statement “Fred is happy,” because Fred is happy most of the time, and the truth value 0.4 can be assigned to the statement “John is happy,” because John is happy slightly less than half the time.

The truth value of the conjunction of two propositions in fuzzy logic is the minimum of the truth values of the two propositions. What are the truth values of the statements “Fred and John are happy” and “Neither Fred nor John is happy?”

ANSWER:

The truth value of the statement that Fred is happy is 0.8. So the truth value of the statement that Fred is not happy is $1 - 0.8 = 0.2$. Again, the truth value of the statement that John is happy is 0.4. So the truth value of the statement that John is not happy is $1 - 0.4 = 0.6$.

Now, the truth value of the statement that Fred and John are happy is the minimum of .8 and 0.4. And it is 0.4. So the truth value is 0.4.

And the truth value of the statement that neither Fred nor John is happy is the minimum of 0.2 and 0.6. And it is 0.2. So the truth value is 0.2.