

INTERMEDIARY TRUTH VALUES

Recall: Think of TRUE as 1 and FALSE as 0. Then AND and OR map $\{0, 1\} \times \{0, 1\}$ to $\{0, 1\}$ and NOT maps $\{0, 1\}$ to $\{0, 1\}$.

What if we allow values in $[0, 1]$? For example, what is AND(0.4,0.7)? or OR(0.1,0.2)? or NOT(0.1431)?

We want you to define AND, OR as functions from $[0, 1] \times [0, 1]$ to $[0, 1]$, and NOT as a function from $[0, 1]$ to $[0, 1]$.

What criteria do we need your AND, OR, NOT to satisfy?

1. Your AND, OR, and NOT on 0's and 1's should be the same as the ordinary ones.
2. Your AND, OR, and NOT should still satisfy De Morgans law.
3. Your AND, OR, and NOT should make some sort of intuitive sense (this is an informal criteria).