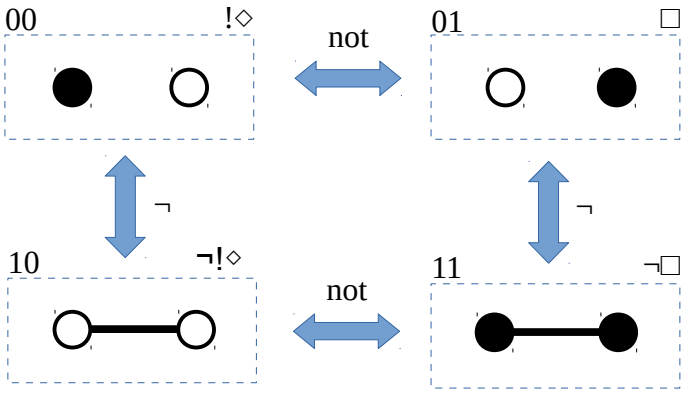
Visualizing Inversion vs NOT in Answered Modal Logic

by Sven Nilsen, 2020

In this paper I visualize inversion (`¬`) vs the generalized logical NOT in Answered Modal Logic.

In Answered Modal Logic, there are two ways to flip bits encoded as a Cubical Binary Code:



The `¬` function is used for inversion, which is the semantics that follows from the answered predicate.

Although the two flip operations have different interpretations,
they are compatible using the Cubical Binary Code encoding, which uses only 2 bits:

not(00) = 01	¬(00) = 10	The two functions flip different bits
not(01) = 00	¬(01) = 11	
not(10) = 11	¬(10) = 00	
not(11) = 10	¬(11) = 01	

This idea can be generalized using a higher order `noth` which has the following property:

∀ x, y { noth(x)[noth(y)] <=> noth(x) }

noth(0) = not
noth(1) = `¬`