The expression for the door (**f = hc' + pc'**) is also shown as the discrete logical equation shown below. There are 8 different varying outcomes, in which this evaluates true for 3 unique cases.

P being true implies that there is a person there

P being false implies that nobody is there

C being true implies that the door is locked

C being false implies that the door is NOT locked

H being true implies that the switch to open the door has been hit

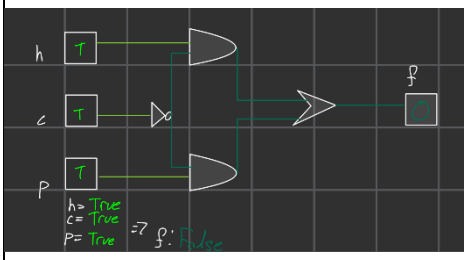
H being false implies that the switch to open the door has NOT been hit

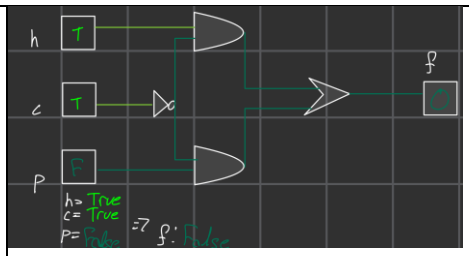
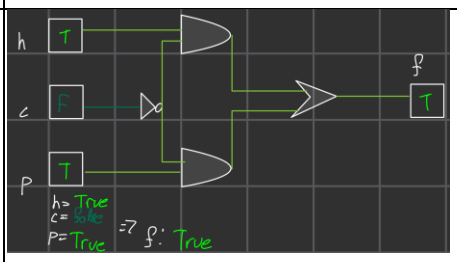
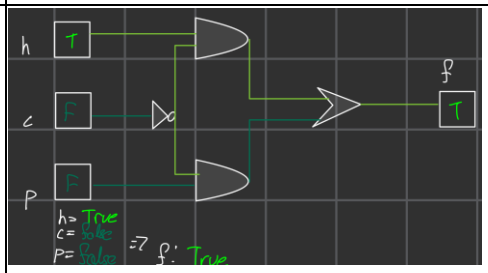
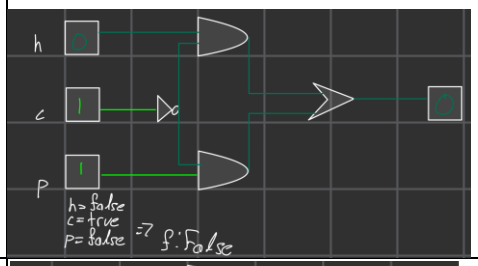
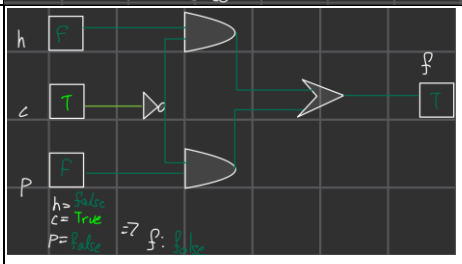
Evaluation using Wolfram Alpha:

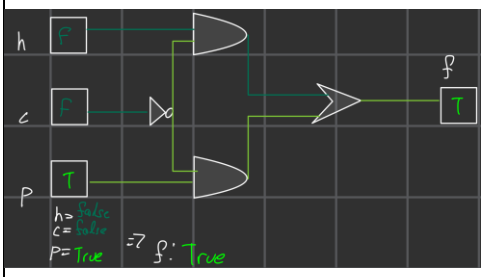
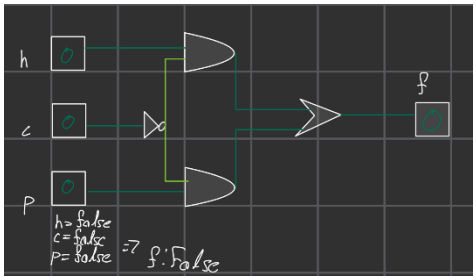
h	c	p	$(h \wedge \neg c) \vee (p \wedge \neg c)$
T	T	T	F
T	T	F	F
T	F	T	T
T	F	F	T
F	T	T	F
F	T	F	F
F	F	T	T
F	F	F	F

Discrete Equation for f:

$(h \wedge \neg c) \vee (p \wedge \neg c)$

h	c	p	f	Diagram	Explanation
T	T	T	F		This implies that the door is locked, so even if somebody is there it will not open

T	T	F	F		This implies that the door is locked and that you will not be able to go through even if the button is hit
T	F	T	T		This implies that the door is NOT locked and that there is a person there, who also happened to hit the button to go through
T	F	F	T		This implies that the button to hit the door was hit, and the door was NOT locked
F	T	T	F		This implies that there is a person there trying to use the door but the door is locked
F	T	F	F		This implies that the door is locked and that there is nobody there to use it

F	F	T	T		This implies that there is somebody there to use the door, and that the door is not locked
F	F	F	F		This one implies that the door is not locked and nobody is there to use it