

We will randomly break into groups of four, based on the card number you receive — all 1's together, all 2's together, etc. This is important: you will meet other members of the class, often some in the group will know more than others or have different, useful ideas. Just breaking into the same groups of friends each week is **suboptimal**. If you are stuck in a “bad” group one week, it's only that week. Try to contribute and help your group.

There will be a D2 Quiz on Moodle tonight in which you should use what you learned in the discussion today to fill in answers to some multiple choice questions.

“What is the **secret** of your long life?” a centenarian was asked. “I strictly follow my diet: If I don't drink beer with dinner, then I always have fish. Any time I have both beer and fish for dinner, I do without ice cream. If I have ice cream or don't have beer, then I never eat fish.”

The questioner found this answer rather confusing. Please simplify it, using the propositional variables:

$b \equiv$ “I drink beer”

$f \equiv$ “I have fish”

$i \equiv$ “I have ice cream”

Call the centenarian's three rules above R_1 , R_2 , and R_3 . Translate each R_i into PropCalc.

$R_1 \equiv$

$R_2 \equiv$

$R_3 \equiv$

Next, draw a truth table for these three rules.

W	b	f	i	R_1	R_2	R_3	$R_1 \wedge R_2 \wedge R_3$
W_7	1	1	1				
W_6	1	1	0				
W_5	1	0	1				
W_4	1	0	0				
W_3	0	1	1				
W_2	0	1	0				
W_1	0	0	1				
W_0	0	0	0				

Finally, using your truth table, try to come up with a simpler PropCalc formula equivalent to $S \stackrel{\text{def}}{=} R_1 \wedge R_2 \wedge R_3$.

$S \equiv$