Write Up_1

1.1) Create truth tables for X and Y and X or Y.

Starting with X and Y:

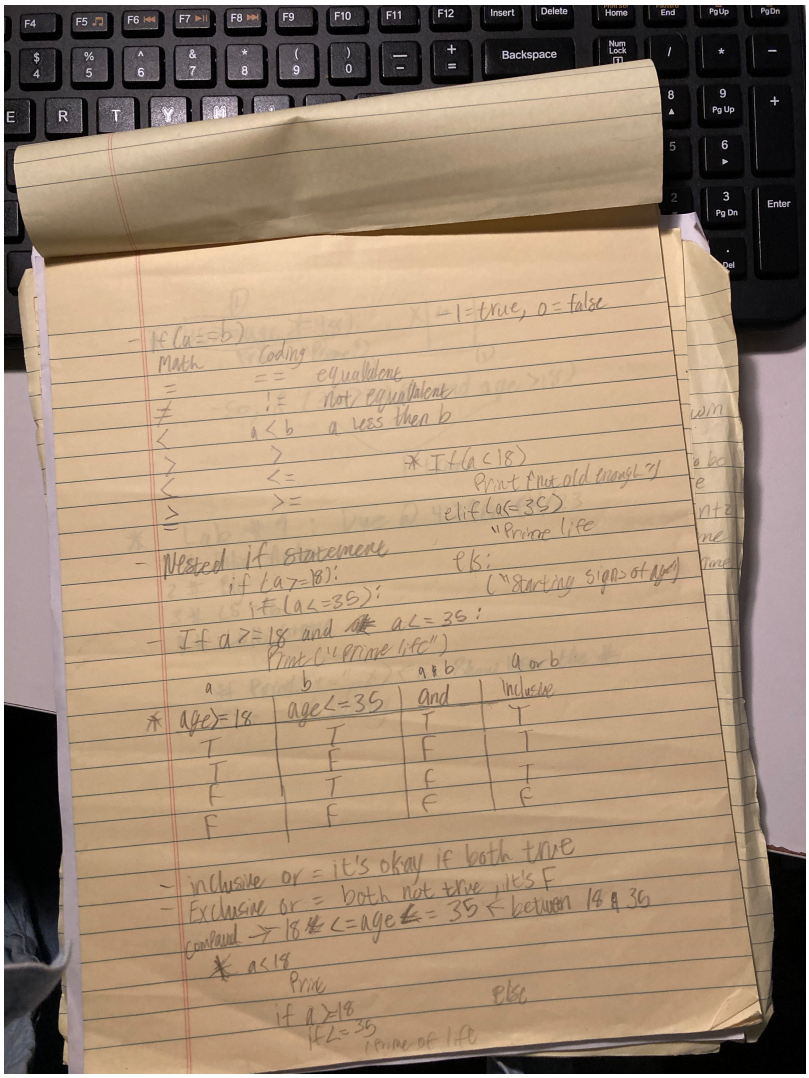
X	Y	X&Y
F	F	F
T	T	T
T	F	F
F	T	F

From reading the class notes, X and Y have to be true at the same. X and Y are uniformed and are dependent on each other; if both X & Y are true, then XY are true and same situation for X & Y being false. When an X or an Y is true or false, then XY are false because X & Y are not the same. So if X is true and Y is false, then XY are false because X and Y are not the same. To help me understand this idea, I thought of pair of socks: if same pair of socks, then true (they belong together). If mismatched socks, then false (they don't go together).

Now with X or Y:

X	Y	X or Y
F	F	F
T	T	T
T	F	T
F	T	T

For this, X is independent and Y is independent. Since X and Y don't depend on each other, then X or Y is true when either a X is true, a Y is true, or X and Y is true. I took CS161 class and we basically used the same idea. This is what we did:



Reference: CS161 Notes

Explanation: What we did was we were trying to figure out what the print statement would be if we input a number that was ≥ 18 and/or ≤ 35. We did a truth table to help us understand that.

1.2) Consider the following statement, for which n represents an unknown integer: If $n < 5$, then $n < 10$.

Referring back to the definition from class notes:

Definition of Negation: If X, then $\sim$Y
Definition of Converse: If Y, then X
Definition of Contrapositive: If $\sim$Y, then $\sim$X
Definition of Inverse: If $\sim$X, then $\sim$Y.

Form of statement:

Negation: If n<5, then n>10

Converse: If n<10, then n<5

Contrapositive: If n>10, then n>5

Inverse: If n>5, then n>10

i) I don't think any of these forms of the conditional statement are true for any n.

For converse: if n=2, then it would be less than 10 and 5. It says that **n is any integer**, so if n=6, then it wouldn't be less than 5, and therefore this would be false.

For contrapositive: if n =2, this would make this form of the conditional statement false.

For inverse: same idea as contrapositive.

For Negation: this won't work either.

ii) Negation, because if the $n < 5$ and $n > 10$ are working against each other. If we chose one n, then it would make this statement false.

iii) Making drawings for this would help me understand what is going on:

For Negation:

$n < 5$	$n > 10$	$X \rightarrow \sim$Y
F	F	T
T	T	F
T	F	T
F	T	T

For Converse:

$n < 10$	$n < 5$	Y $\rightarrow$ X
F	F	F
T	T	T
T	F	T
F	T	F

For contrapostive:

$n > 10$	$n > 5$	$\sim Y \rightarrow \sim X$
F	F	F
T	T	T
T	F	F
F	T	T

For inverse:

$n > 5$	$n > 10$	$\sim X \rightarrow \sim$ Y
F	F	F
T	T	T
T	F	T
F	T	F

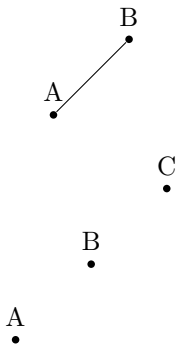
After figuring out how the table would result for each on scrap paper, I came to the conclusion that converse and inverse were logically equivalent.

I processed like this on my scrap paper: If there was an integer that was both greater than 10 (T), then the integer is definitely be greater than 5 (T) which makes this true. If the integer was less than 10 (F), then less then 5 (F), which makes this false. We would proceed this with idea with the rest of the tables. For the all the false and true (first and second columns), I thought of its' opposites: if $n > 5$ was false, then I would think that $n < 5$ and same idea with the trues. While doing this, I would then got the results for the third column.

1.4a) Consider the following statements, for which A, B, and C represent distinct points:

X is the statement "A and B are collinear."
Y is the statement "B is between A and C."

Making a drawing:



Is (X and Y) true or false?:

I think this is false. X is saying that AB are collinear and Y is saying that ABC are collinear. AB is not the same as ABC. As I mentioned before then and would mean that X & Y would have be the same; since it is not the, this is false.

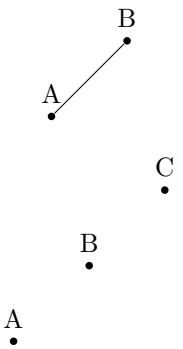
1.4b) Is (X or Y) true or false?

This would be true. As stated in the class notes, the or can be inclusive or exclusive so the statements can be different. Since X is the statement "A and B are collinear" and Y is the statement "B is between A and C," then this is true because which they are saying different thing, but they are both true.

1.4c) Is (if X, then Y) true or false?

This is saying if "A and B are collinear," then "B is between A and C." I believe this is neither because there is not enough information on statement Y. One is talking about AB being collinear and the other one is talking about B is between A and C. What I don't know is if these A, B, and C lie are on the same line.

I came to this conclusion because I remember during our group meeting, we were debating if 1.3 was true or not. We came to the conclusion of neither because there was not enough information.



1.4d) Is (if Y, then X) true or false?

This is saying that if "B is between A and C," then "A and B are collinear." I think this true. I basically made two drawing and added the idea together and made a 3rd drawing: