Instructions:

a) Identify if the statement has structure. If it doesn’t, mark it as being simple.

b) If the statement has structure, separate the sentence into its independent statements and connect them into one long statement using ‘and,’ ‘or’ and ‘it is not the case that’, and ‘if… then…’ filling in the pronouns for clarity.

c) Assign a capital letter to represent each independent statement.

d) Using only the capital letters from c) and the ampersand symbol (&), the wedge (\lor), the horseshoe (\supset), and the tilde (~), rewrite b).

Example Problem:

Oranges grow well only if there is no late frost.

Example Answer:

If oranges grow well, it is not the case that there is a late frost.

Let O = “Oranges grow well.”
Let F = “There is a late frost.”

O \supset \sim F

1. Roses are yellow if they are grown in Tulia, TX.
   If the roses are grown in Tulia, TX, then the roses are yellow.
   Let T = “The roses are grown in Tulia, TX.”
   Let Y = “The roses are yellow.”

   T \supset Y

2. If we don’t have any birdseed, the birds won’t come.
   If it is not the case that we have birdseed, then it is not the case that the birds will come.
   Let B = “We have birdseed.”
   Let C = “The birds will come.”
   \sim B \supset \sim C

3. Unless she is sick, Jenn is not going to miss the party.
   If it is not the case that Jenn is sick, then it is not the case that Jenn is going to miss the party.
   Let S = “Jenn is sick.”
   Let M = “Jenn is going to miss the party.”
   \sim S \supset \sim M

4. If Wendy or Erica comes, she will clean up before the party. (Tricky one)
   No translation is perfect, but the best translation is, “If Wendy comes then Wendy will clean up before the party, and if Erica comes, then Erica will clean up before the party.”
   Let W = “Wendy comes.”
   Let E = “Erica comes.”
   Let X = “Wendy will clean up before the party.”
   Let Y = “Erica will clean up before the party.”
   (W \supset X) \& (E \supset Y)
5. If Rick and Laura both don’t smoke, we can have the party at their cabana. 
If [it is not the case that Rick smokes and it is not the case that Laura smokes], then we can have the party at Rick and Laura’s cabana. 
Let R = “Rick smokes.” 
Let L = “Laura smokes.” 
Let P = “We can have the party at Rick and Laura’s cabana.” 

\((\neg R \& \neg L) \supset P\)

6. Only if we bribe the mayor, will we get the big project. 
We will get the big project only if we bribe the mayor. 
Let P = “We will get the big project.” 
Let B = “We bribe the mayor.” 

\(P \supset B\)

7. Neither rain nor snow will stop Hal if he has all his gear. 
If Hal has all Hal’s gear, then it is not the case that (either rain will stop Hal, or snow will stop Hal). 
Let G = Hal has all Hal’s gear. 
Let R = “Rain will stop Hal.” 
Let S = “Snow will stop Hal.” 

\(G \supset \neg (R \lor S)\)

8. If Sandra shows up, we’ll order pizza, but otherwise, we’ll order Chinese. 
(If Sandra shows up, then we’ll order pizza), and (if it is not the case that Sandra shows up, then we’ll order Chinese). 
Let S = “Sandra shows up.” 
Let P = “We will order pizza.” 
Let C = “We will order Chinese.” 

\((S \supset P) \& (\neg S \supset C)\)

9. Trent won’t show up unless Bobby isn’t going to be there. 
Unless it is not the case that Bobby is going to be there, then it is not the case that Trent will show up. 
If it is not the case that it is not the case that Bobby is going to be there, then it is not the case that Trent will show up. 
Let B = “Bobby is going to be there.” 
Let T = “Trent will show up.” 

\(\sim B \supset \sim T\)

10. If Chris wrecks the sofa, then if we have a party, we won’t have enough chairs. 
If Chris wrecks the sofa, then (if we have a party, then it is not the case that we will have enough chairs.) 
Let C = “Chris wrecks the sofa.” 
Let P = “We have a party.” 
Let E = “We have enough chairs.” 

\(C \supset (P \supset \sim E)\)
11. The ball is red only if it’s colored.
Let $R = \text{“The ball is red.”}$
Let $C = \text{“The ball is colored.”}$
“If the ball is red, then (it must be the case that) the ball is colored.”
$R \supset C$

12. My relative is an aunt only if the relative is female.
Let $A = \text{“My relative is an aunt.”}$
Let $F = \text{“My relative is female.”}$
“If my relative is an aunt, then (it must be the case that) my relative is female.”
$A \supset F$

13. I can go out tonight only if I get my paper written.
Let $G = \text{“I can go out tonight.”}$
Let $W = \text{“I get my paper written.”}$
“If I can go out tonight, then (it must be the case that) I will have gotten my paper written.”
$G \supset W$

14. Without getting my paper written, I can’t go out tonight.
Same as above. $G \supset W$

15. If I don’t get my paper written, I can’t go out tonight.
Same as above. $G \supset W$