Solution to Example in your text book.

You need to find your glasses and you try to think back to where they could be in order to locate them.

a) If my glasses are on the Kitchen table, then I saw them at breakfast.
b) I was reading the newspaper in the living room or I was reading in the kitchen.
c) If I was reading the newspaper in the living room, then my glasses are on the coffee table.
d) I did not see my glasses at breakfast.
e) If I was reading my book in bed, then my glasses are on the bed table.
f) If I was reading the newspaper in the kitchen, then my glasses are on the kitchen table.

Solution and write up:
The symbolic logic for the above statements is given below. All statement are considered to be true.

a) \( T \rightarrow B \), \( T \): glasses on kitchen table, \( B \): saw them at breakfast
b) \( L \lor K \), \( L \): reading in the living room, \( K \): reading in the kitchen
c) \( L \rightarrow C \), \( C \): glasses on the coffee table
d) \( \sim B \)
e) \( O \rightarrow E \): \( O \): reading in bed, \( E \): glasses on bed table
f) \( K \rightarrow T \)

“I did not see my glasses at breakfast “ is a true statement. Since the implication \( T \rightarrow B \) is a true statement and the necessary condition \( B \) is false, the sufficient condition \( T \) must also be false; so my glasses are not on the kitchen table. If my glasses are not on the kitchen table and \( K \rightarrow T \) is a true implication, then by the same reasoning as before we have that \( K \) must be false and I was not reading the newspaper in the kitchen. Since I was not reading in the kitchen and \( L \lor K \) is a true statement and \( K \) is false, then \( L \) must be true, and I was reading in the living room. Since I was reading in the living room is the sufficient condition for the true implication, \( L \rightarrow C \), then the necessary condition \( C \) is also true and my glasses are on the coffee table.