Problem: If R and S are transitive relations on a set A, then R U S is not transitive on A, where R /\S is transitive on A.

Solution:
Let (x,y) in R /\ S and (y,z) in R /\ S.

Required to Prove (RTP): (x,z) in R /\ S.

Now, (x,y) in R /\ S => (x,y) in R and (x,y) in S.
Again, (y,z) in R /\ S => (y,z) in R and (y,z) in S.

Since R is transitive and (x,y) in R and (y,z) in R => (x,z) in R
(x, z) in S.

=> (x,z) in R /\ S.

[Counterexample] A = {a, b, c}
R = {(a,a), (a,b)}
S = {(a,a), (b,b), (b,c)}

R U S = {(a,a), (a,b), (b, b), (b,c)} is NOT transitive on A.