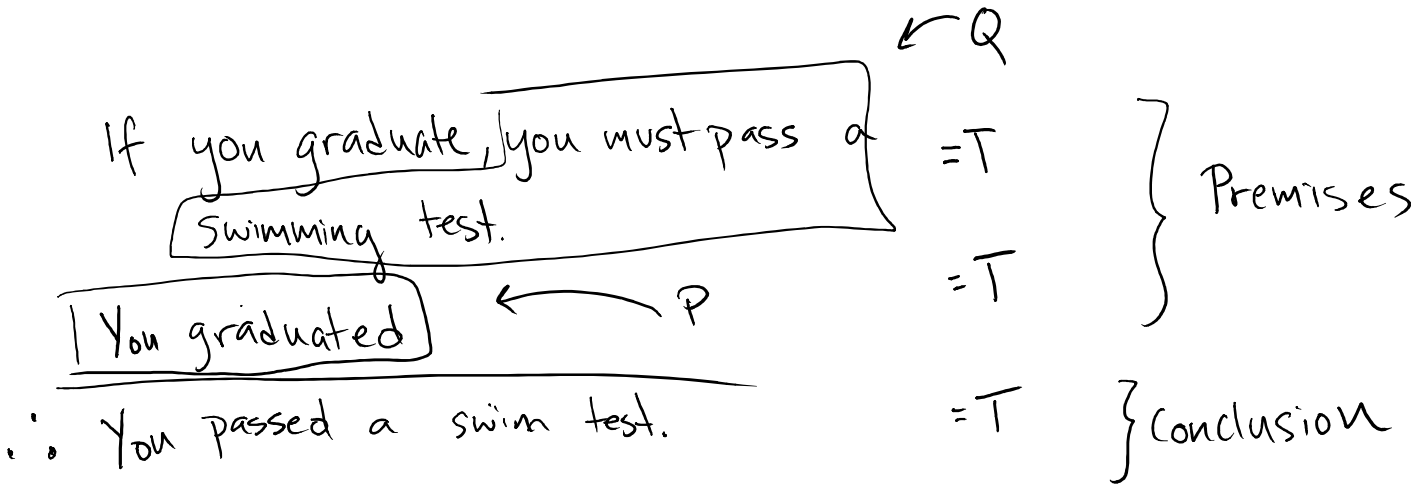


Deductions: using known true statements to create new true statements



$$\frac{P \rightarrow Q}{P} \therefore Q$$

If $P \rightarrow Q$ is true and P is true, then Q must be true

graduate P	pass swim test Q	$P \rightarrow Q$
T	T	T
T	F	F
F	T	T
F	F	T

If premises are true, conclusion is true. If premises are false, conclusions don't hold.

This is like inductive Proof!
 $P(k)$ is true \rightarrow $P(k+1)$ is true

W V S

$W \wedge P \rightarrow \neg T$

$T \rightarrow P \vee S$

$S \rightarrow P$

T



∴

W = ?

P = ?

S = ?

Solution

W	P	S	T
T	T	T	
T	T	F	
T	F	T	
T	F	F	
F	T	T	T
F	T	F	
F	F	T	
F	F	F	

In Words:

Because T and $T \rightarrow P \vee S$, must have P V S.

If $\neg S$, then must have

P. But must have W because W V S is true because $(W \wedge P) \rightarrow \neg T$

But now $W \wedge P$, so we must have $\neg T$. But T is true, so we must have gone wrong. Only choice was $\neg S$, so instead, try S. Then since $S \rightarrow P$, we have P. Now we can't have W, otherwise $\neg T$. Thus S, P, $\neg T$, Black