



# Exercise from yesterday

Give truth tables for the following expressions:

①  $\neg(s \wedge t)$

②  $\neg s \vee \neg t$

Compare the two.

*What did you find?*

# Truth Values

$s$	$t$	$s \wedge t$	$\neg(s \wedge t)$	$\neg s$	$\neg t$	$\neg s \vee \neg t$
T	T	T	F	F	F	F
T	F	F	T	F	T	T
F	T	F	T	T	F	T
F	F	F	T	T	T	T

# Definition

## Definition (deMorgan's law)

$$\neg(s \wedge t) = \neg s \vee \neg t$$

# Exclusive or

$s$	$t$	$s \oplus t$	$s \vee t$	$s \wedge t$	$\neg(s \wedge t)$	$(s \vee t) \wedge \neg(s \wedge t)$
T	T	F	T	T	F	F
T	F	T	T	F	T	T
F	T	T	T	F	T	T
F	F	F	F	F	T	F

# Exercise

Consider the following statement:

*Alice and Bob are not both ill.*

- 1 Define predicate symbols and rewrite the statement in symbolic form.
- 2 Use deMorgan's law to rephrase the statement.
- 3 Rephrase the statement in English (or Norwegian), using the word 'well' rather than 'ill'.