

Mathematical Foundations for Software Engineering

Course notes

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1 About

This document is Attila Matolcsy's own personal notes from the University of Gothenburg's Software Engineering and Management Bsc. Programme's Mathematical Foundations for SEM course.

These are all the notes from TA sessions, mostly unprocessed.

2 Logic

R = Annual revenue N = Net profit

A = Acme computer S = Nadir Software Q = Quixote Media

- $R(A) = 138$ Bil. \$
- $N(A) = 8$ Bil. \$
- $A(S) = 87$ Bil. \$
- $N(S) = 5$ Bil. \$
- $A(Q) = 111$ Bil. \$
- $N(Q) = 13$ Bil. \$

a) F

b) $T \wedge T \equiv T$

c) $F \vee T \equiv T$

d) $F \Rightarrow T \equiv T$

e) $T \Leftrightarrow T \equiv T$

$$(p \vee q \vee r) \wedge (\neg p \vee \neg q \vee \neg r)$$

$$A = (p \vee q \vee r)$$

$$B = (\neg p \vee \neg q \vee \neg r)$$

$$C = A \wedge B$$

p	q	r	s	A $p \vee \neg q \vee s$	B $\neg p \vee \neg r \vee s$	C $\neg p \vee \neg r \vee \neg s$	D $\neg p \vee q \vee \neg s$	E $q \vee r \vee \neg s$	F $q \vee \neg r \vee \neg s$	G $\neg p \vee \neg q \vee \neg s$	H $p \vee r \vee s$	I $p \vee r \vee \neg s$	$ \{A - I\} $
T	T	T	T	T	T	F	T	T	T	F	T	T	7
T	T	T	F	T	F	T	T	T	T	T	T	T	8
T	T	F	T	T	T	T	T	T	T	F	T	T	8
T	T	F	F	T	T	T	T	T	T	T	T	T	<u>9</u>
T	F	T	T	T	T	F	F	T	F	T	T	T	6
T	F	T	F	T	F	T	T	T	T	T	T	T	8
T	F	F	T	T	T	T	F	F	T	T	T	T	7
T	F	F	F	T	T	T	T	T	T	T	T	T	<u>9</u>
F	T	T	T	T	T	T	T	T	T	T	T	T	<u>9</u>
F	T	T	F	F	T	T	T	T	T	T	T	T	<u>9</u>
F	T	F	T	T	T	T	T	T	T	T	T	F	8
F	T	F	F	F	T	T	T	T	T	T	F	T	8
F	F	T	T	T	T	T	T	T	F	T	T	T	8
F	F	T	F	T	T	T	T	T	T	T	T	T	<u>9</u>
F	F	F	T	T	T	T	T	F	T	T	T	F	7
F	F	F	F	T	T	T	T	T	T	T	F	T	8