SOEN228 Midterm Cheat Sheet

System Hardware (Concordia University)

Cheat Sheet

A B	A AND B	A OR B	A XOR B	A NOR B	A NAND B
00	0	0	0	1	1
01	0	1	1	0	1
10	0	1	1	0	1
11	1	1	0	0	0

Clk	S	R	$Q(t+1)$
0	x	x	$Q(t)$ (no change)
1	0	0	$Q(t)$ (no change)
1	0	1	0
1	1	0	1
1	1	1	x

Clk	D	$Q(t+1)$
0	x	$Q(t)$
1	0	0
1	1	1

T	$Q(t+1)$
0	$Q(t)$
1	$\overline{Q}(t)$

J	K	$Q(t+1)$
0	0	$Q(t)$
0	1	0
1	0	1
1	1	$\overline{Q}(t)$

Name	Algebraic identity	
Commutative	$w + y = y + w$	$wy = yw$
Associative	$(w + y) + z = w + (y + z)$	$(wy)z = w(yz)$
Distributive	$w + yz = (w + y)(w + z)$	$w(y + z) = wy + wz$
Idempotent	$w + w = w$	$ww = w$
Involution	$\overline{\overline{w}} = w$	
Complement	$w + \overline{w} = 1$	$w\overline{w} = 0$
de Morgan	$\overline{w + y} = \overline{w}\ \overline{y}$	$\overline{wy} = \overline{w} + \overline{y}$
	$1 + w = 1$	$0 \cdot w = 0$
	$0 + w = w$	$1 \cdot w = w$

RISC-type addressing modes.

Name	Assembler syntax	Addressing function
Immediate	#Value	Operand = Value
Register	R*i*	EA = R*i*
Absolute	LOC	EA = LOC
Register indirect	(R*i*)	EA = [R*i*]
Index	X(R*i*)	EA = [R*i*] + X
Base with index	(R*i*,R*j*)	EA = [R*i*] + [R*j*]

EA = effective address
Value = a signed number
X = index value