HW2 CE303

P1:

	col1	col2	col3	col4	col5
row1	1	1	0	1	0
row2	1	0	1	0	1
row3	1	0	0	1	0
row4	0	1	1	1	0
row5	0	1	0	1	1
row6	1	0	1	1	0

Col 4 dominates Col 2 so Col 2 is removed

	col1	col3	col4	col5
row1	1	0	1	0
row2	1	1	0	1
row3	1	0	1	0
row4	0	1	1	0
row5	0	0	1	1
row6	1	1	1	0

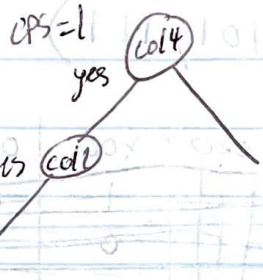
Row 3 dominates Row 1 so Row 3 is removed
Row 6 dominates Row 4 so Row 6 is removed

	Col1	Col3	Col4	Col5
Row1	1	0	1	0
Row2	1	1	0	1
Row4	0	1	1	0
Row5	0	0	1	1

This is the cyclic core so we branch & bound

Branch & Bound

U=5
L=2



so this is optimal, {col4, col1}

	col1	col3	col5
Row2	1	1	1

All dominate each other so all equal

P2: ~~1~~ ~~2~~ ~~3~~ ~~4~~ ~~5~~ ~~6~~ ~~7~~ ~~8~~ ~~9~~

(i) $S(0000, 0101, 0110, 1010, 1011, 1101)\ d(0100, 1000, 1110)$

	col1	col2	col3
√0000		0-00	
√0100		-000	
√1000		010-	
√0101		01-0	
√0110		10-0	
√1010		-101	
√1011		-110	
√1101		101-	
√1110		1-10	

Prime implicants

	0x00	x000	010x	01x0	10x0	x101	x110	101x	1x10
0000	1	1	0	0	0	0	0	0	0
0101	0	0	1	0	0	1	0	0	0
0110	0	0	0	1	0	0	1	0	0
1010	0	0	0	0	1	0	0	1	0
1011	0	0	0	0	1	0	0	1	0
1101	0	0	0	0	0	1	0	0	1

101x is essential, x101 is essential

0x00 dominates x000, 01x0 dominates x110

↳ use 101x, x101, 0x00, 01x0

↳ $f(a,b,c,d) = a\bar{b}c + b\bar{c}d + \bar{a}\bar{c}\bar{d} + \bar{a}b\bar{d}$

P2:

(2) $S(000, 010, 011, 100, 101, 111)$

col 1	col 2	col 3
√000	0-0	
√010	-00	
√100		
√011	01-	
√101	10-	
√111	-11	
	1-1	

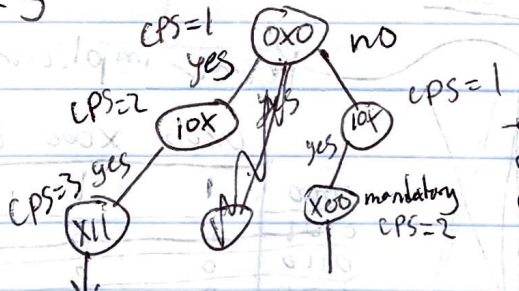
Prime implicants

	0x0	x00	01x	10x	x11	1x1
000	1	1	0	0	0	0
010	1	0	1	0	0	0
011	0	0	1	0	1	0
100	0	1	0	1	0	0
101	0	0	0	1	0	1
111	0	0	0	0	1	1

$U = 7$

$L = 3$

Branch & Bound



	x00	01x	10x	x11	1x1
011	0	1	0	1	0
100	1	0	1	0	0
101	0	0	1	0	1
111	0	0	1	1	1

x11 dominates 1x1 & 01x

	x00	01x	x11	1x1
000	1	0	0	0
010	0	1	0	0
011	0	1	1	0
101	0	0	1	1

Table is empty & CPS = L so we found optimal solution

↳ use 0x0, 10x, x11

↳ $f(a,b,c) = \bar{a}\bar{c} + a\bar{b} + bc$