

Pre-Lab 3

	CS	LS	RS	RR	CL	LL	RL
0	0	0	0	0	0	0	1
1	0	0	0	1	0	0	1
2	0	0	1	0	0	0	1
3	0	0	1	1	0	0	1
4	0	1	0	0	0	1	0
5	0	1	0	1	0	1	0
6	0	1	1	0	0	1	0
7	0	1	1	1	0	0	1
8	1	0	0	0	1	0	0
9	1	0	0	1	1	0	0
10	1	0	1	0	1	0	0
11	1	0	1	1	1	0	0
12	1	1	0	0	1	0	0
13	1	1	0	1	1	0	0
14	1	1	1	0	0	1	0
15	1	1	1	1	1	1	0

CL

CS \ RS	00	01	11	10
00	0	0	1	1
01	0	0	1	1
11	0	0	1	1
10	0	0	1	1

• SOP cost less since it has one less logic gate than POS form.

SOP: $CL = (CS)$
- Cost: One input

POS: $CL = (CS)'$
- Cost: One gate (total gates: 1), one inputs

RL

CS \ RS	00	01	11	10
00	1	0	0	0
01	1	0	0	0
11	1	0	0	0
10	1	0	0	0

• POS form is better since less variation in gates needed

SOP: $RL = (CS)'(LS)' + (CS)'(RS)(RR)$
- Cost: One 2-input AND, One 3-input AND, One 2-input OR (total gates: 3)

POS: $RL = CS \cdot (LS + RR)' \cdot (LS + RS)'$ 7 inputs
- Cost: Two 2-input OR, One 3-input AND (total gates: 3) 7 inputs

LL

CS \ RS	00	01	11	10
00	0	1	0	0
01	0	1	0	0
11	0	0	0	0
10	0	1	0	0

• POS form is better because less gates and less inputs needed.

SOP: $LL = (CS)'(LS)(RR)' + (CS)'(LS)(RS)'$
- Cost: Two 3-input AND, One 2-input OR (total gates: 3) 8 inputs

POS: $LL = CS \cdot LS' \cdot (RS + RR)$
- Cost: One 2-input OR, One 3-input AND (total gates: 2) 5 inputs