ASDV 1205, Digital Design Lab

1. Design the circuit: Assume a room has three doors and a switch by each door controls a single light in the room.
– Let A, B, and C denote the state of the switches
– Assume the light is off if all switches are off
– Turning on any switch turns the light on. Turning off another switch will have
to turn the light off.
– Light is on if any one switch is on and off if two (or no) switches are on.
– Light is on if all three switches are on

A	B	C	Output
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

2. Car safety alarm
• Design a car safety alarm considering four inputs
– Door closed (D)
–Key in (K)
– Seat pressure (S)
– Seat belt closed (B)
• The alarm (A) should sound if
– The key is in and the door is not closed, or
– The door is closed and the key is in and the driver is in the seat and the seat belt is not closed
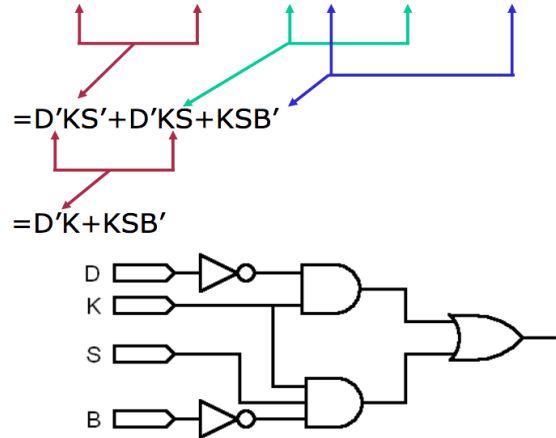

Car safety alarm

D K S B	A
0 0 0 0	0
0 0 0 1	0
0 0 1 0	0
0 0 1 1	0
0 1 0 0	1
0 1 0 1	1
0 1 1 0	1
0 1 1 1	1
1 0 0 0	0
1 0 0 1	0
1 0 1 0	0
1 0 1 1	0
1 1 0 0	0
1 1 0 1	0
1 1 1 0	1
1 1 1 1	0

$A(D,K,S,B)=\Sigma m(4,5,6,7,14)$
$A(D,K,S,B)=D'KS'B'+D'KS'B+D'KSB'+D'KSB+DKSB'$

$=D'KS'+D'KS+KSB'$

$=D'K+KSB'$