Devoir 1

Martin Chaperot: 20205638
Hamza Ali Ousalah: 20249230

(a) Table de vérité

	A	B	C	D	V
0	0	0	0	0	0
1	0	0	0	1	0
2	0	0	1	0	0
3	0	0	1	1	0
4	0	1	0	0	0
5	0	1	0	1	0
6	0	1	1	0	1
7	0	1	1	1	1
8	1	0	0	0	0
9	1	0	0	1	0
10	1	0	1	0	1
11	1	0	1	1	1
12	1	1	0	0	1
13	1	1	0	1	1
14	1	1	1	0	1
15	1	1	1	1	1

(b) SOP de la fonction V

Initial Setup				
Minterm	A	B	C	D
—	—	—	—	—
6	0	1	1	0
10	1	0	1	0
12	1	1	0	0
7	0	1	1	1
11	1	0	1	1
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

First Reduction				
Pair	A	B	C	D
(6,7)	0	1	1	-
(6,14)	-	1	1	0
(10,11)	1	0	1	-
(10,14)	1	-	1	0
(12,13)	1	1	0	-
(12,14)	1	1	-	0
(7,15)	-	1	1	1
(11,15)	1	-	1	1
(13,15)	1	1	-	1
(14,15)	1	1	1	-

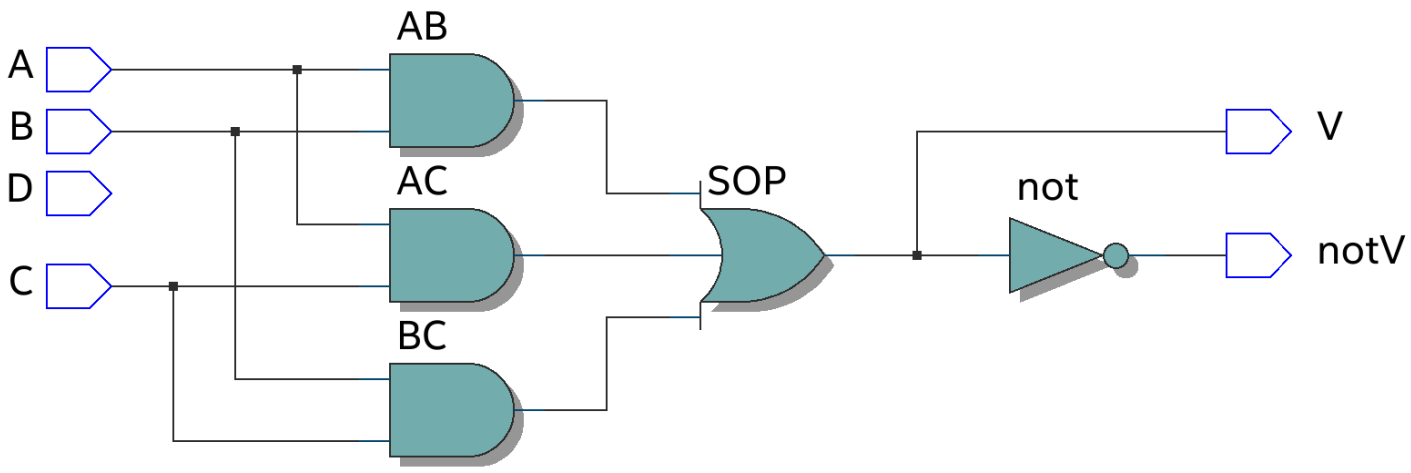
Second Reduction					
Quad	A	B	C	D	
(6,7,14,15)	1	-	1	-	*
(10,11,14,15)	-	1	1	-	*
(12,13,14,15)	1	1	-	-	*

	Minterms							
Prime Implicants	0110	0111	1010	1011	1100	1101	1110	1111
1-1-			✓	✓			✓	✓
-11-	✓	✓					✓	✓
11–					✓	✓	✓	✓

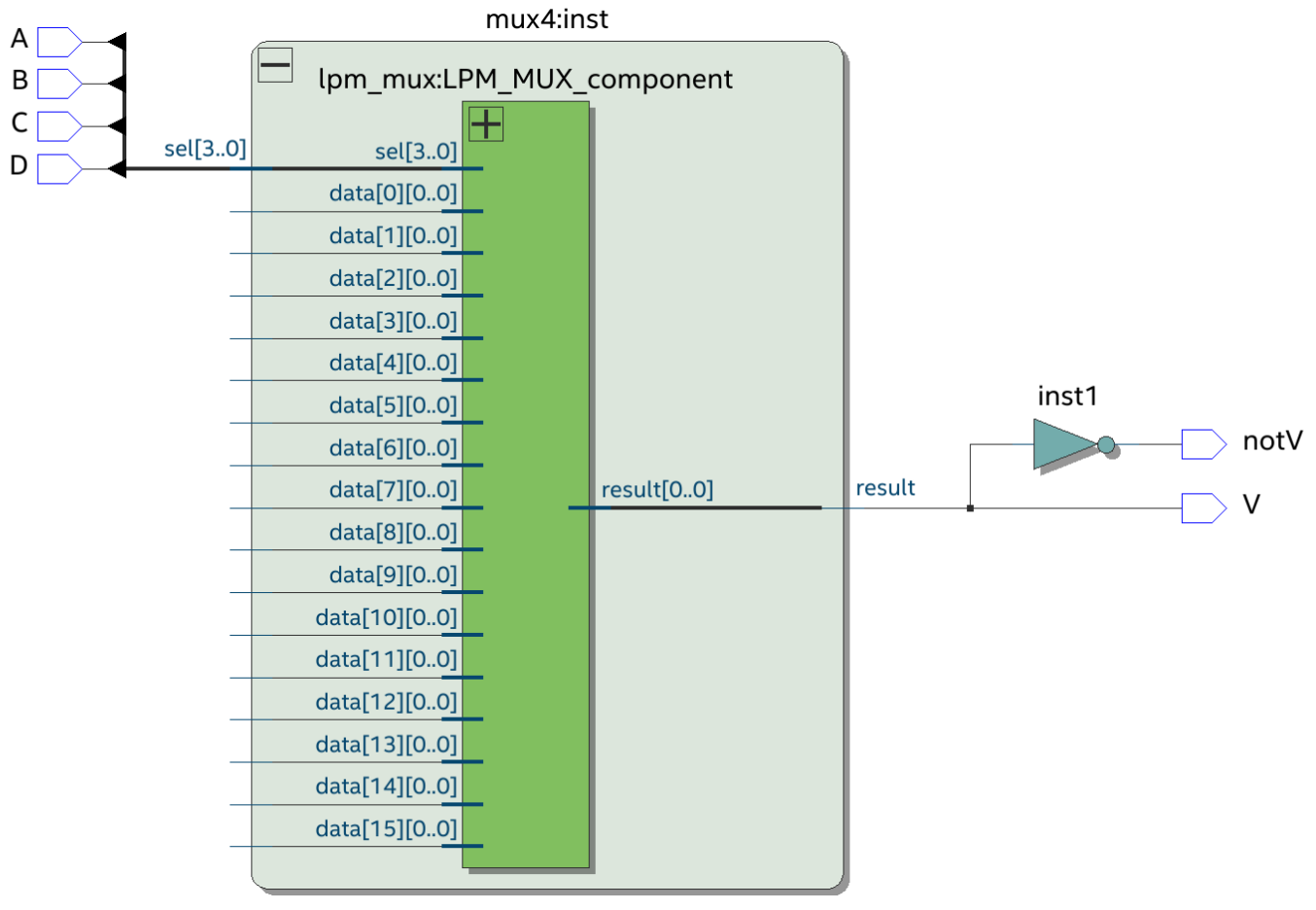
$V(A, B, C, D) = AC + BC + AB$

(c) Implementation

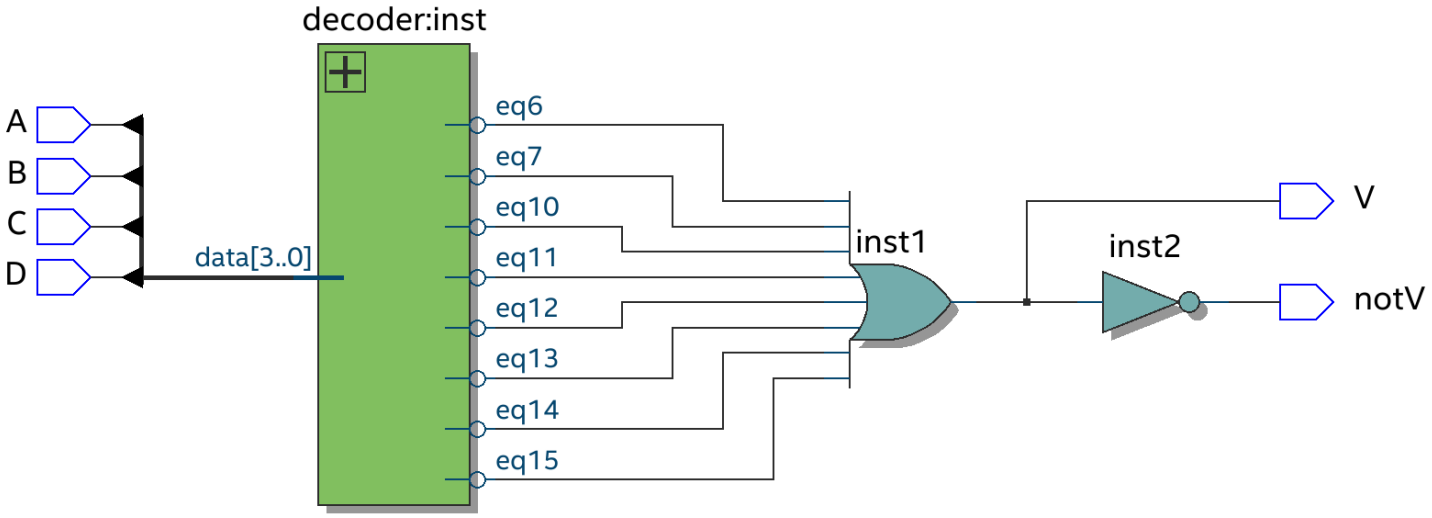
1



2



3


decoder:inst
A
B
C
D
data[3..0]
eq6
eq7
eq10
eq11
eq12
eq13
eq14
eq15
inst1
inst2
V
notV