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Semester: 6th

Subject: DLD Lab-9

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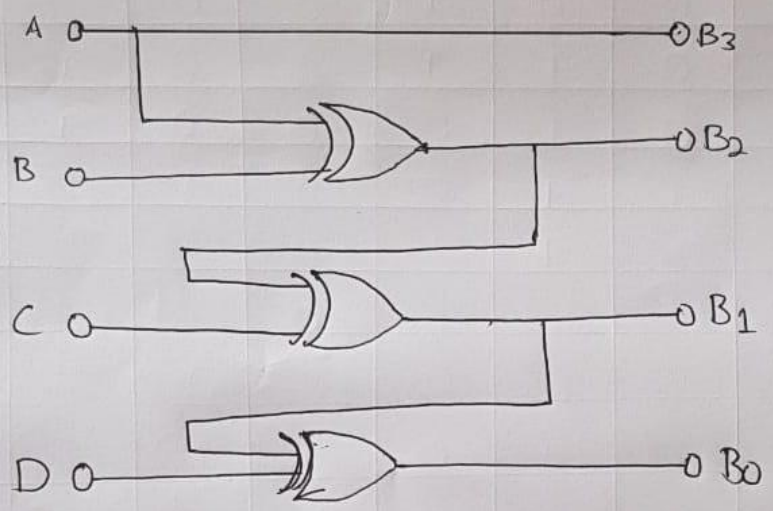
Lab 10: Gray to Binary Code

Circuit Diagram of Binary to Gray Code Converter



Observation Table:

Input Variable: A B C D

Output Variable: B_3, B_2, B_1, B_0

KMAP Simplification.

For B_3

For B_2

For B_1

For B_0

Boolean Expression:

B_3? B_2? B_1? B_0?

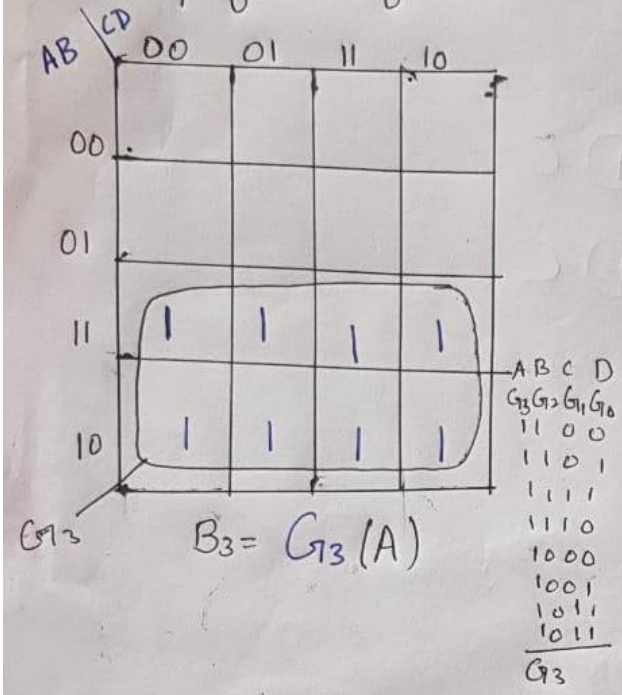
Observation Table

Gray → Binary

Inputs				Outputs			
A	B	C	D	B_3	B_2	B_1	B_0
0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	1
0	0	1	1	0	0	1	0
0	0	1	0	0	0	1	1
0	1	1	0	0	1	0	0
0	1	1	1	0	1	0	1
0	1	0	1	0	1	1	0
0	1	0	0	0	1	1	1
1	1	0	0	1	0	0	0
1	1	0	1	1	0	0	1
1	1	1	1	1	0	1	0
1	1	1	0	1	0	1	1
1	0	1	0	1	1	0	0
1	0	1	1	1	1	0	1
1	0	0	1	1	1	1	0
1	0	0	0	1	1	1	1

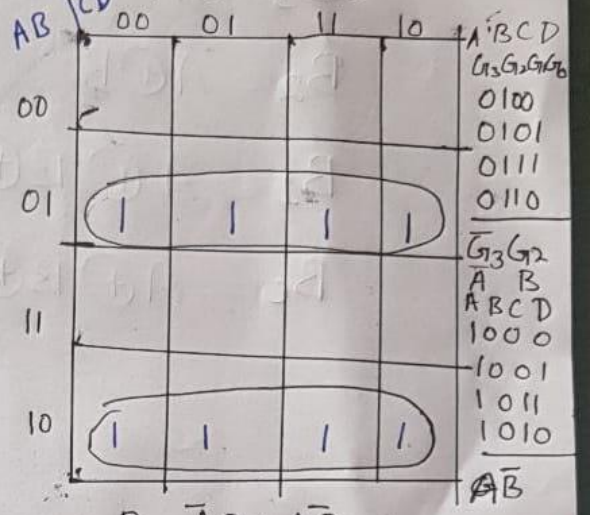
KMAP Simplification

Simplification for B_3



$B_3 = G_{13}(A)$

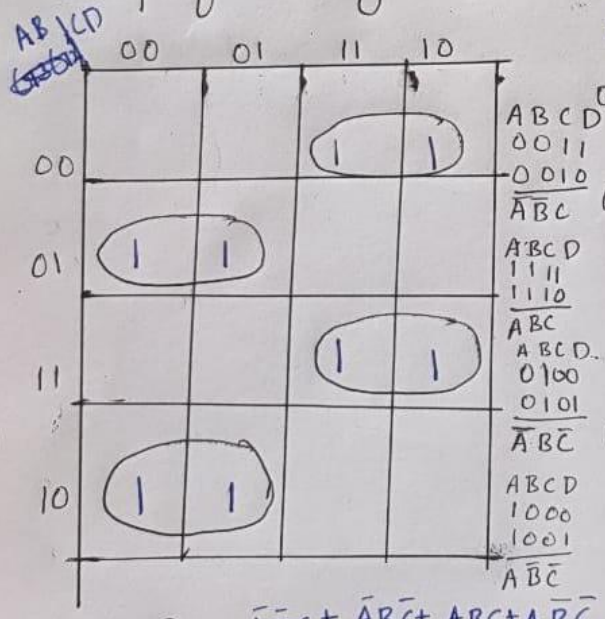
Simplification for B_2



$B_2 = \bar{A}B + A\bar{B}$

$= A \oplus B$

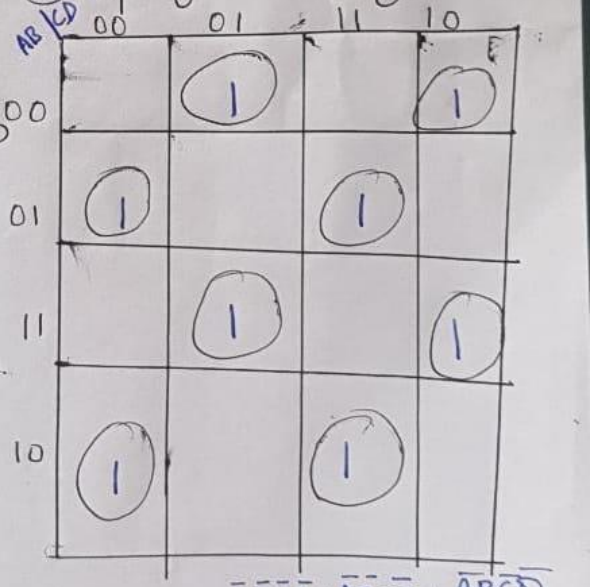
Simplification for B_1



$B1 = \bar{A}\bar{B}C + \bar{A}B\bar{C} + ABC + A\bar{B}\bar{C}$

$= A \oplus B \oplus C$

Simplification for B_0



$B0 = \bar{A}\bar{B}\bar{C}\bar{D} + \bar{A}\bar{B}C\bar{D} + \bar{A}\bar{B}\bar{C}D + \bar{A}BC\bar{D} + \bar{A}BCD + AB\bar{C}D + ABC\bar{D} + A\bar{B}\bar{C}\bar{D} + A\bar{B}CD$

$B0 = A \oplus B \oplus C \oplus D$

Boolean Expression:-

$B_3 = A$

$B_2 = A \oplus B$

$B_1 = A \oplus B \oplus C$

$B_0 = A \oplus B \oplus C$