LAB-5

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S20200010234

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Aim: To convert grey to Binary Code. ~~Software~~

Software Used - Logisim software

Method:

Grey Mode	G_3	G_2	G_1	G_0
Binary Code	B_3	B_2	B_1	B_0
	↓	↓	↓	↓
	G_3	$B_3 \oplus G_2$	$B_2 \oplus G_1$	$B_1 \oplus G_0$

Table -

Input				Output			
G_3	G_2	G_1	G_0	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	0	0	0	1	0
0	0	1	1	0	0	1	1
0	1	0	0	0	1	1	1
0	1	0	1	0	1	1	0
0	1	1	0	0	1	1	0
0	1	1	1	0	1	0	1
1	0	0	0	1	1	0	1
1	0	0	1	1	1	1	0
1	0	1	0	1	1	1	0
1	0	1	1	1	1	0	1
1	1	0	0	1	0	0	0
1	1	0	1	1	0	0	1
1	1	1	0	1	0	1	1
1	1	1	1	1	0	1	0

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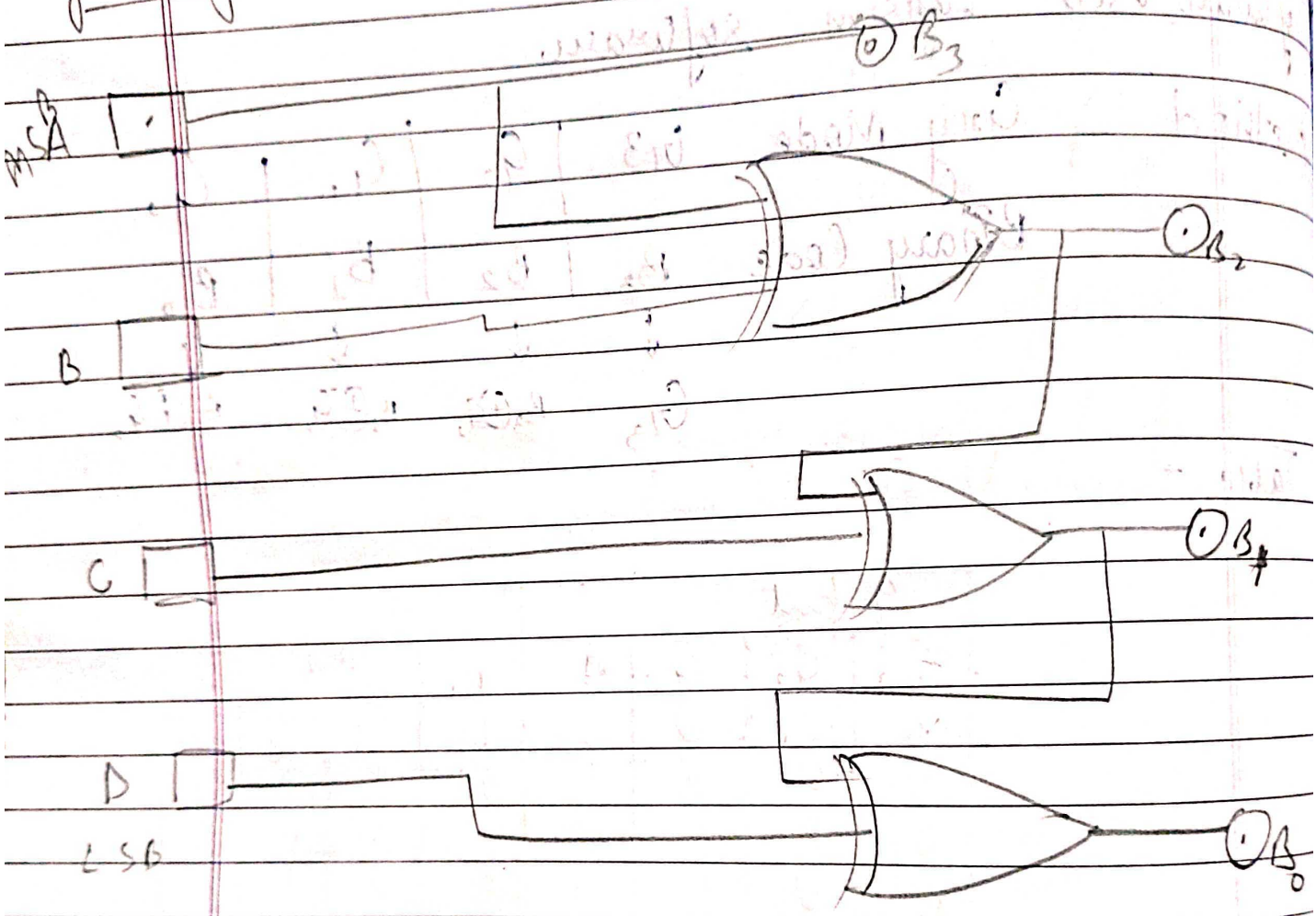
Logic Diagram



Conclusion

This circuit is verified by changing values in circuit

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Aim - Convert Binary to Grey code

Software Used - Logisim Software

Method - Binary code B_3 | B_2 | B_1 | B_0

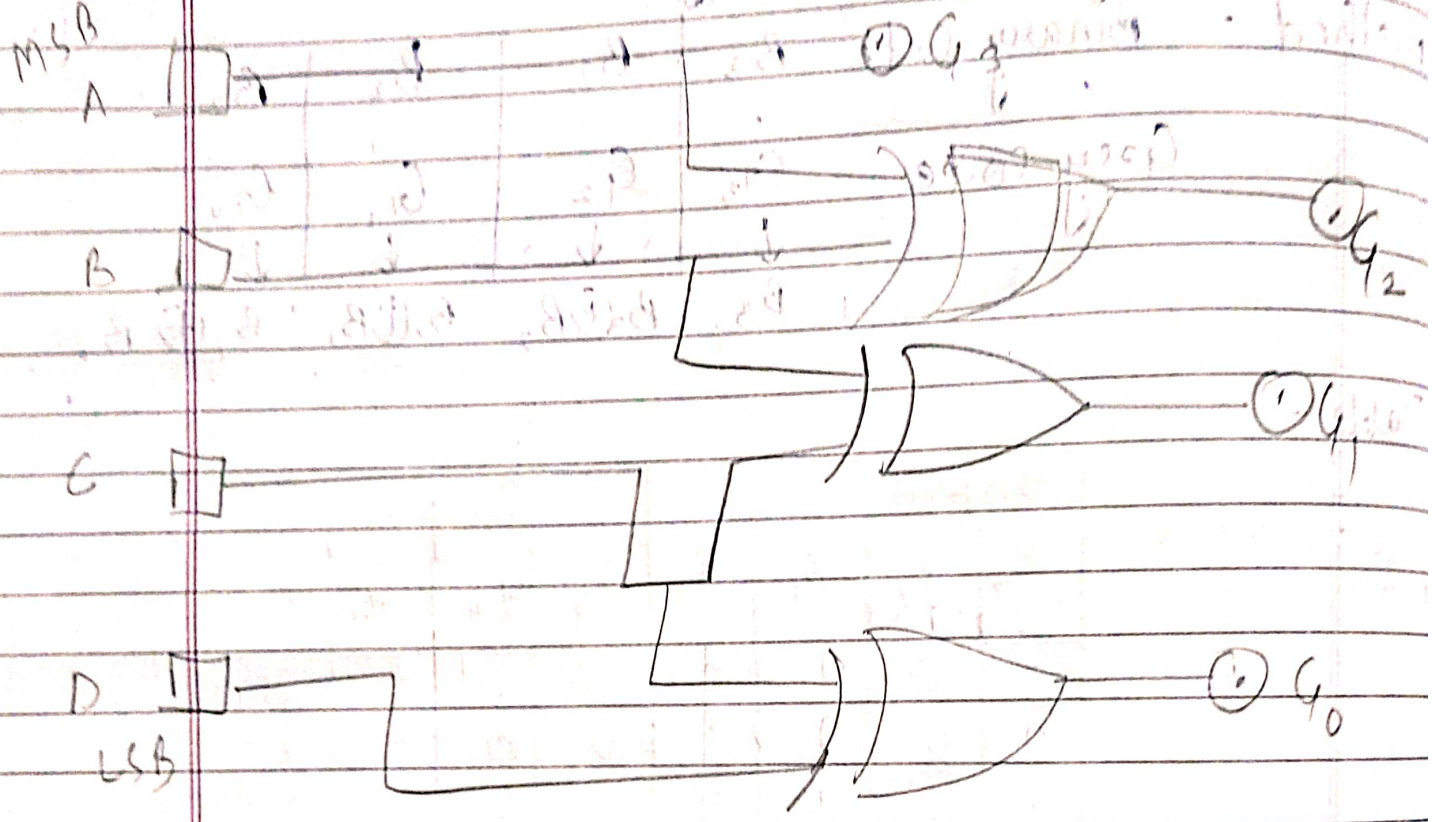
Grey code G_3 | G_2 | G_1 | G_0

B_3 | $B_3 \oplus B_2$ | $B_2 \oplus B_1$ | $B_1 \oplus B_0$

Table -

Input				Output			
B_3	B_2	B_1	B_0	G_3	G_2	G_1	G_0
0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	1
0	0	1	0	0	0	1	1
0	0	1	1	0	0	1	0
0	1	0	0	0	1	1	0
0	1	0	1	0	1	1	1
0	1	1	0	0	1	0	1
0	1	1	1	0	1	0	0
1	0	0	0	1	1	0	0
1	0	0	1	1	1	0	1
1	0	1	0	1	1	1	1
1	0	1	1	1	1	1	0
1	1	0	0	1	0	1	0
1	1	0	1	1	0	1	1
1	1	1	0	1	0	0	1
1	1	1	1	1	0	0	0

Logic Diagram



Conclusion — This circuit is verified by changing values in circuit

Aim - To make 2 Bit multiplier Circuit

Software used - Logisim used

Method - Let $A_1 A_0$ and $B_1 B_0$ are two Binary

$$\begin{array}{r} A_1\ A_0 \\ B_1\ B_0 \\ \hline A_1B_0\ \ A_0B_0 \\ B_1A_1\ \ B_1A_0\ \ x \\ \hline P_3\ \ P_2\ \ P_1\ \ P_0 \end{array}$$

$P_0 = A_0 B_0$

$P_1 = SUM(A_1 B_0, B_1 A_0)$

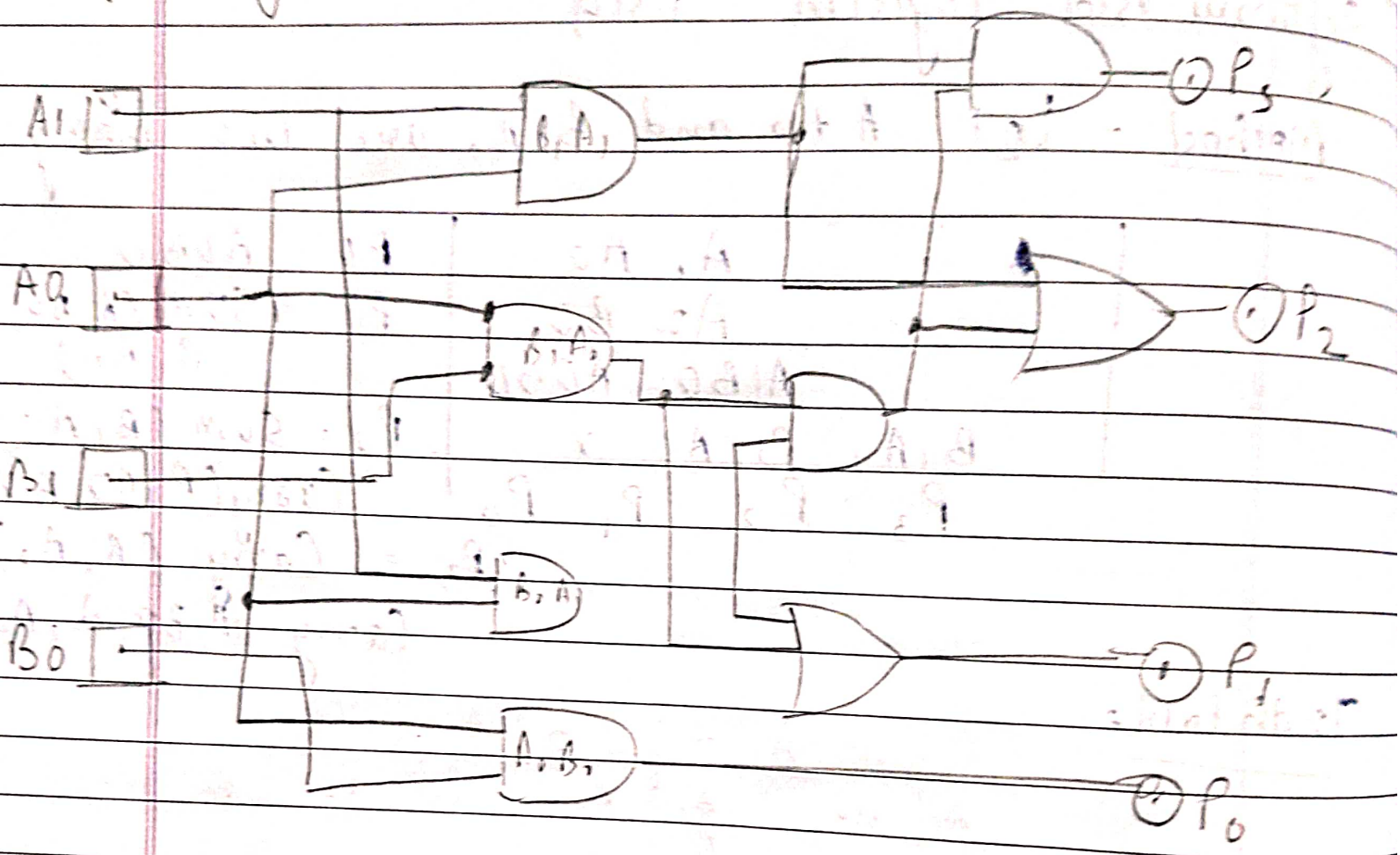
$P_2 = SUM(B_1 A_1, Carry(A_1 B_0, B_1 A_0))$

$P_3 = Carry(B_1 A_1, Carry(A_1 B_0, B_1 A_0))$

Truth table

Input A		Input B		Output			
A_1	A_0	B_1	B_0	P_3	P_2	P_1	P_0
0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0
0	0	1	0	0	0	0	0
0	0	1	1	0	0	0	0
0	1	0	0	0	0	0	0
0	1	0	1	0	0	0	1
0	1	1	0	0	0	1	0
0	1	1	1	0	0	1	1
1	0	0	0	0	0	0	0
1	0	0	1	0	0	1	0
1	0	1	0	0	1	0	0
1	0	1	1	0	1	1	0
1	1	0	0	0	0	0	0
1	1	0	1	0	0	1	1
1	1	1	0	0	1	1	0
1	1	1	1	1	0	0	1

Logic Diagram



Conclusion:

This circuit is verified by changing values in circuit