Task 1: Data Rep. and Boolean logic

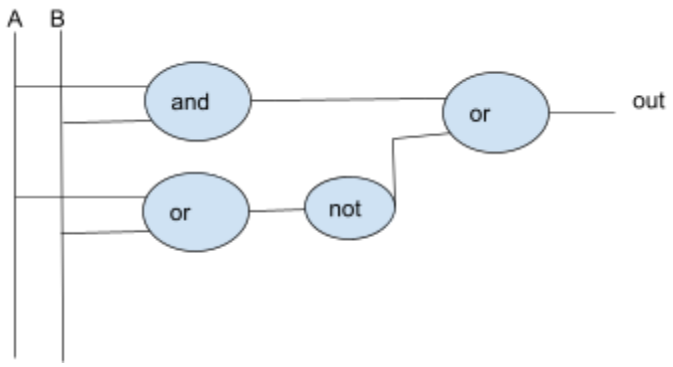
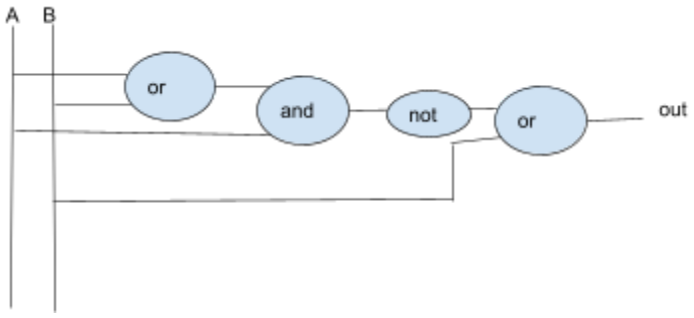
Save this document in your repository for Unit 2 with name:
data_rep_boolean_log.md

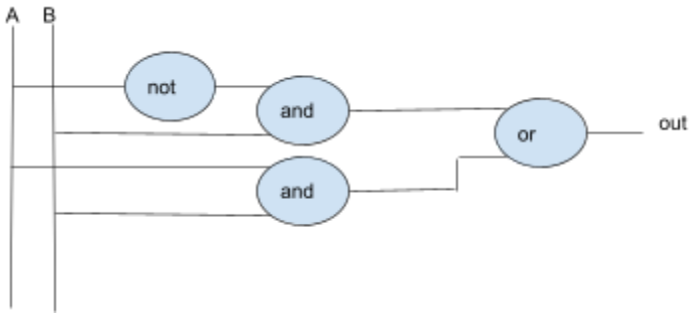
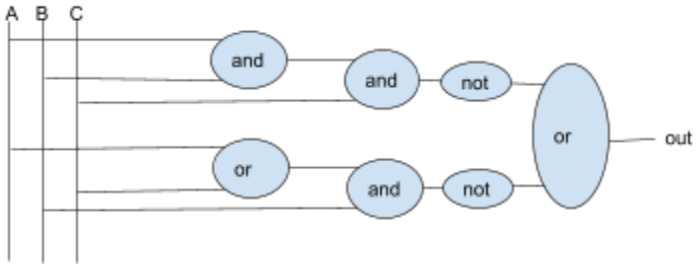
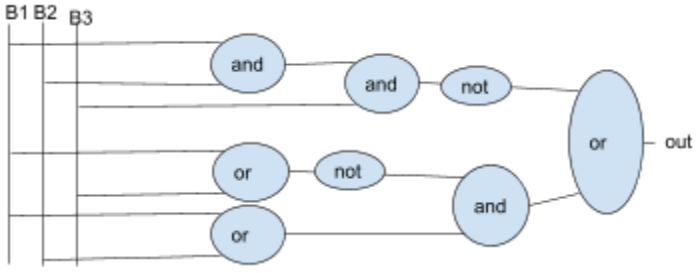
🤔 Resources (Learning Log):

4	Notes Topic 2:	Computer Architecture
5	Boolean Algebra	Video about boolean algebra
6	Examples Base Conversion	Whiteboard notes on conversion of numbers with different bases

Boolean Logic

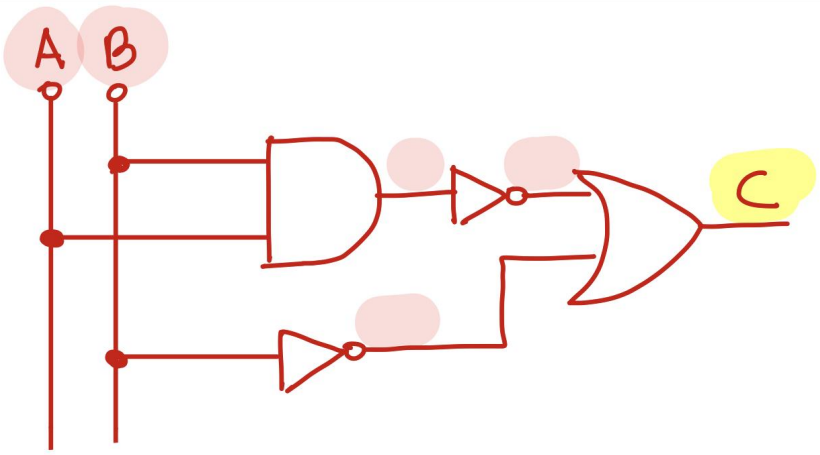
Draw the circuit for the boolean equations provided

Boolean Equation	Circuit
$AB+\overline{(A + B)}$	
$\overline{A(A + B)} + B$	

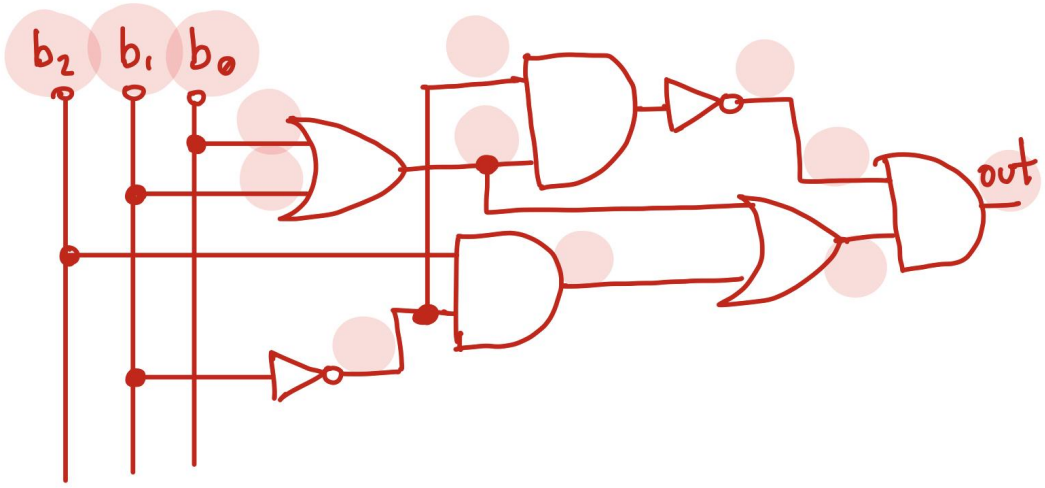
`((not A) and B) or (A and B)`	
$\overline{ACB} + \overline{(A + C)B}$	
[HL] $\overline{b1b2b3} + \overline{(b1 + b3)}(b1 + b2)$	

Get the Equation

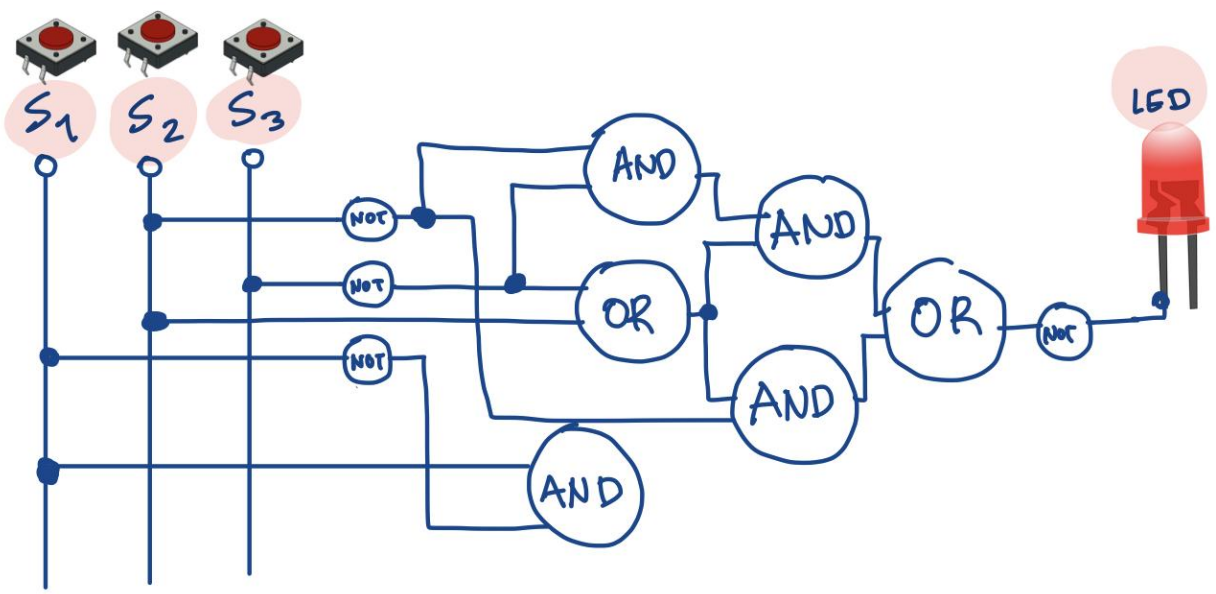
Write the boolean equation for the circuit shown




```
C = not(AB)+not(C)
```




```
out = not(((b2+b0)not(b1))((b2+b0)+b2notb1))
```



LED =

Truth table

Write the truth table for the equations below

Boolean Equation	Truth Table
X = A and B	A, B, X 0, 0, 0 0, 1, 0 1, 0, 0 1, 1, 1
Out = input1 or input2	input1, input2, out 0, 0, 0 0, 1, 1 1, 0, 1 1, 1, 1

Light = $\overline{S_1} + \overline{(S_2 + S_3)} + S_1 S_2 \overline{S_3}$

S1	S2	S3	
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	0

[HL]

Login = $\overline{P_1 P_2 P_3} + \overline{(P_3 \overline{P_2 P_1})} + \overline{P_1 + P_3}$

P1	P2	P3	
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	0

Data Conversion

Information can be represented in different systems, for example the number `10` in decimal (system base 10) can be represented in binary (system base 2) as `1010` or `12` in base 8.

It is critical for you to understand how to represent information in different ways, this will help you visualize how the computer processes data.

Original Number	Convert to

`256 (Decimal)`	`Base 2 (Binary)`
	`100000000`
	
	`Base 4`
	`10000`
	
	`Base 6`
	`1104`

`433 (Base 5)`	`Base 10 (Decimal)`
	`118`
	
	`Base 8 (Octal)`
	`166`
	
	`Base 16 (Hexadecimal)`
	`76`

FA32 (Base 16)	Base 10 64050 Base 2 111110100011010 Base 8 16506