WEEK 1 - Worked Example

Given a function $F = \bar{A}B + \bar{B}C$, produce a logic gate diagram and a truth table.

Solution The order of precedence is NOT, AND, OR. This means that when we evaluate the function, we evaluate NOT first then AND then OR
There are 3 variables A, B, C so the truth table will have $2^3 = 8$ rows covering all possible combinations of A, B, C. (2 because this is a binary system)

A B C	$\bar{A}$	$\bar{A}.B$	$\bar{B}$	$\bar{B}C$	F
0 0 0	1	0	1	0	0
0 0 1	1	0	1	1	1
0 1 0	1	1	0	0	1
0 1 1	1	1	0	0	1
1 0 0	0	0	1	0	0
1 0 1	0	0	1	1	1
1 1 0	0	0	0	0	0
1 1 1	0	0	0	0	0

calculate $\bar{A}$ and $\bar{B}$ before 'AND'ing

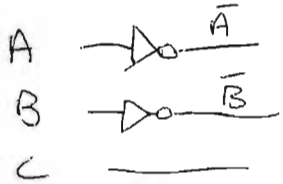
$F = \bar{A}B + \bar{B}C$ order of precedence is telling us that this is the same as

$$F = (\bar{A}B) + (\bar{B}C)$$

calculate these terms before 'OR'ing

To construct a logic diagram:
The inputs (generally taken from the left) are A, B, C

① form the NOT of A and B as NOT has the highest order of precedence.



② Form the AND terms $\bar{A}B$ and $\bar{B}C$

③ OR $\bar{A}B$ with $\bar{B}C$