# FPGA-assignment1

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## 1 6.a Question

State any one Absorption law of Boolean Algebra and verify it using truth table.

## 2 Solution

#### 2.1 Verifying laws

The following laws are called as Absorption laws of Boolean Algebra.

$$1.x + xy = x$$
$$2.x(x + y) = x$$

Verifying law 1:

X	У	xy	x+xy
0	0	0	0
0	1	0	0
1	0	0	1
1	1	1	1

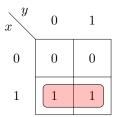
Verifying law 2:

X	У	x+y	x(x+y)
0	0	0	0
0	1	1	0
1	0	1	1
1	1	1	1

## 2.2 K-MAP implementation

1.x + xy

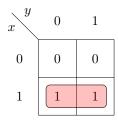
The SOP max terms are considered for minimizing the law1 through k-map



From the k-map , the implicant is x , so output z=x+xy=x

$$2.x(x+y)$$

The SOP max terms are considered for minimizing the law 2 through k-map



From the k-map , the implicant is x , so output z=x(x+y)=x

## 2.3 implementation of laws using NAND gate

minimal equivalent of law 1 x + xy is x(obtained by k-map)

