Programmable Logic Device (PLD)

- Logic devices provide specific functions, device to device interfacing, data communication, signal processing, data display, timing and control operations.

- Logic devices can be categorized as two types:

1. Fixed Logic Device – The circuits in the fixed logic devices are permanent, they perform one function or set of functions, once they manufactured can not be erased.

2. **Programmable Logic Devices**- They can be reconfigured for any number of functions at any time. PLD is an integrated chip that contains large number of gates, flip-flop and registers that are interconnected on the chip. There are different types of programmable logic devices. The internal logic gates AND/OR connections of PLD's can be changed or configured by programming. One of the simplest programming technologies is to use fuses. In the original state of the device, all the fuses are intact. Programming the logic means blowing the fuses along the paths that must be removed in order to obtain the particular configuration of the logic function.

Programmable Logic Device (PLD)

There are various types of programmable logic devices:

i. Complex programmable logic devices (CPLD)

ii. Field programmable gate array (FPGA)

iii. Simple Programmable logic devices (SPLD)

- Programmable read only memory (PROM)
- Programmable logic array (PLA)
- Programmable array logic (PAL)

Programmable Logic Device (PLD)

Device	AND Array	OR Array
PROM	Fixed	Programmable
PAL	Programmable	Fixed
PLA	Programmable	Programmable

Programmable Logic Device - PROM

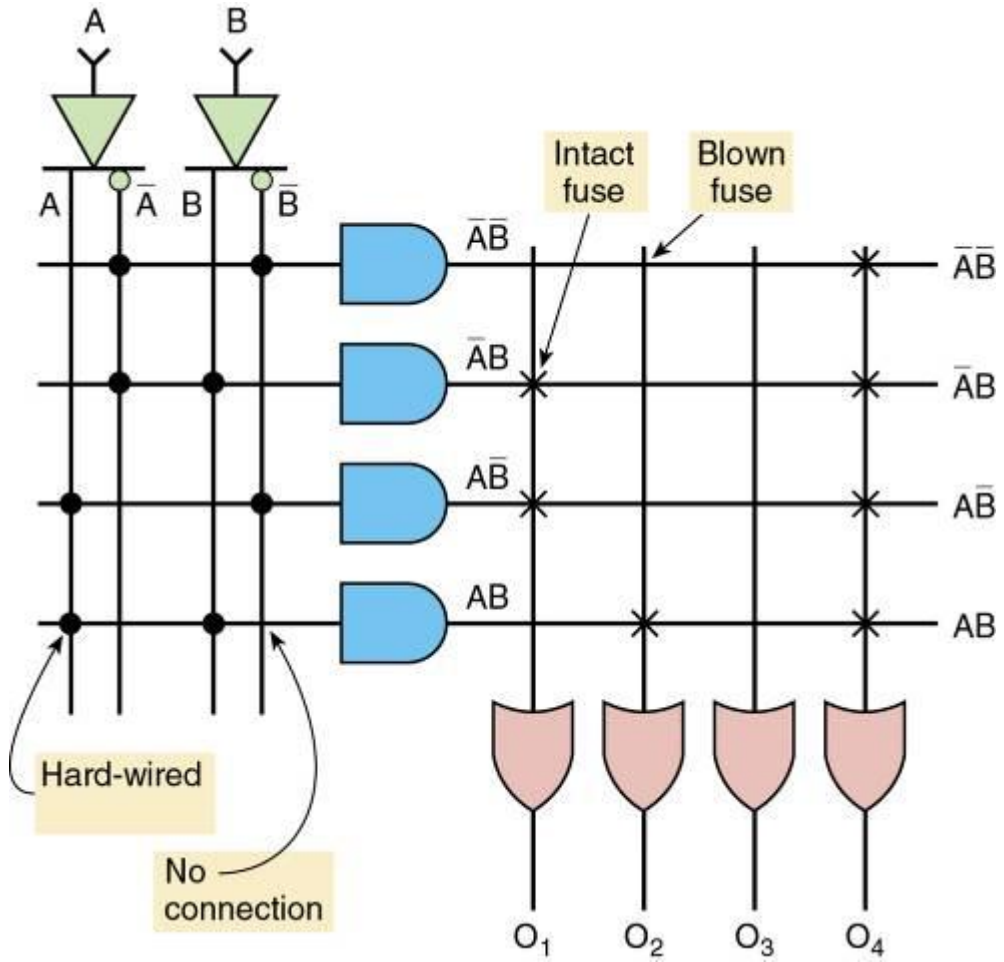
Let us implement the Boolean functions using PROM architecture of PLD:

O1 = $\bar{A}B + A\bar{B}$

O2 = AB

O3 = 0

O4 = 1

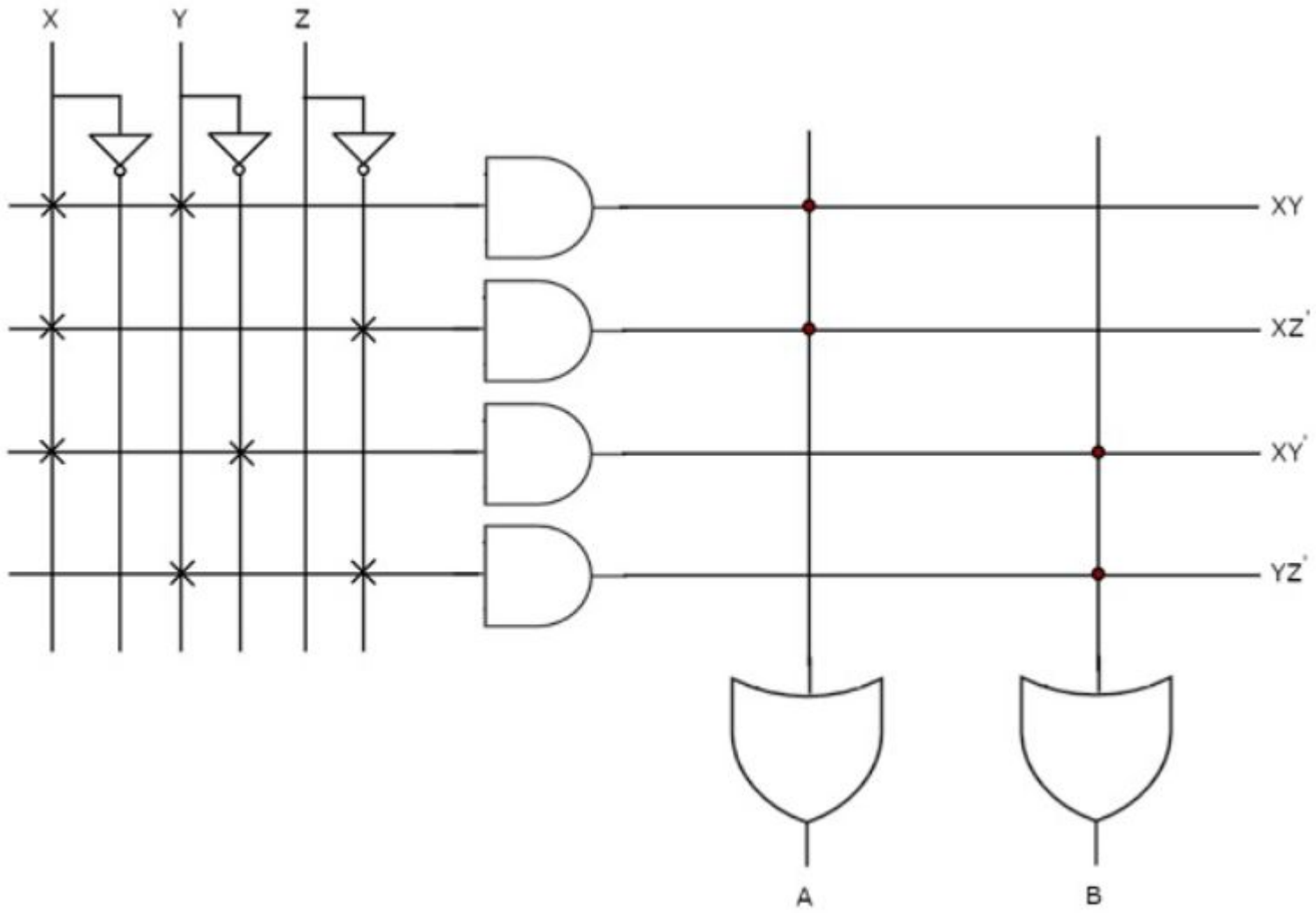


Programmable Logic Device - PAL

Let us implement the following **Boolean functions** using PAL.

$$A = XY + XZ'$$

$$A = XY' + YZ'$$



Programmable Logic Device - PLA

Let us implement the following **Boolean functions** using PLA.

$$A = XY + XZ'$$

$$B = XY' + YZ + XZ'$$