Quaid-e-Awam University of Engineering, Science and Technology

بسم الله الرحمن الرحيم

In the name of Allah, the Most Merciful, the Most Kind

Date: 12-11-2021

BCS 103
Digital Logic & Computer Architecture

Lecture 31 and 32

Department of Computer Science

LAST LECTURE

In the Last Lecture

- **Decoder (2x4)**
- **Decoder (3x8)**

- **Encoder (4x2)**
- **Decimal to BCD Encoder**

TODAY'S LECTURE

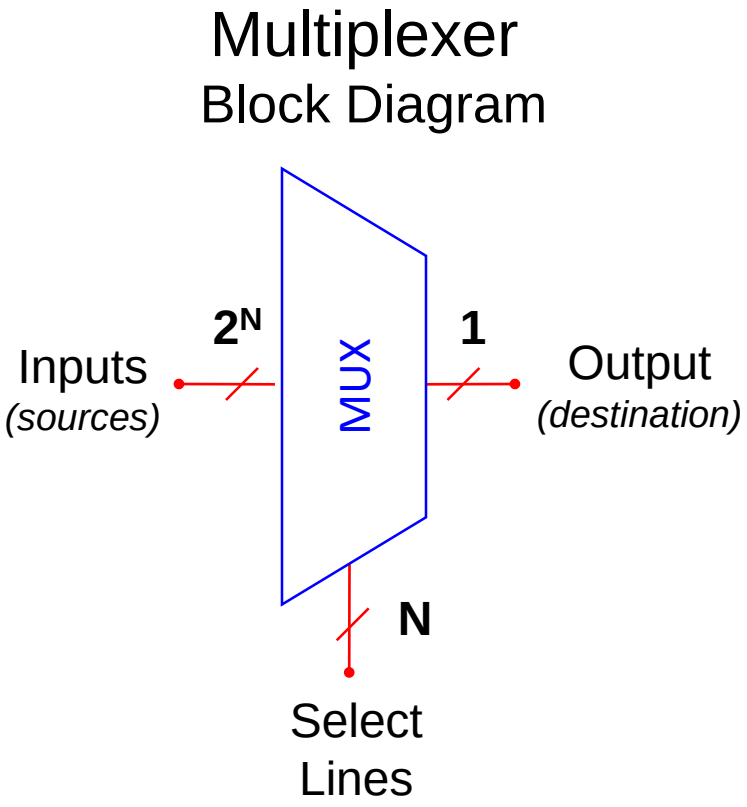
Today we will discuss about:

- **Multiplexer**
- **De-multiplexer**

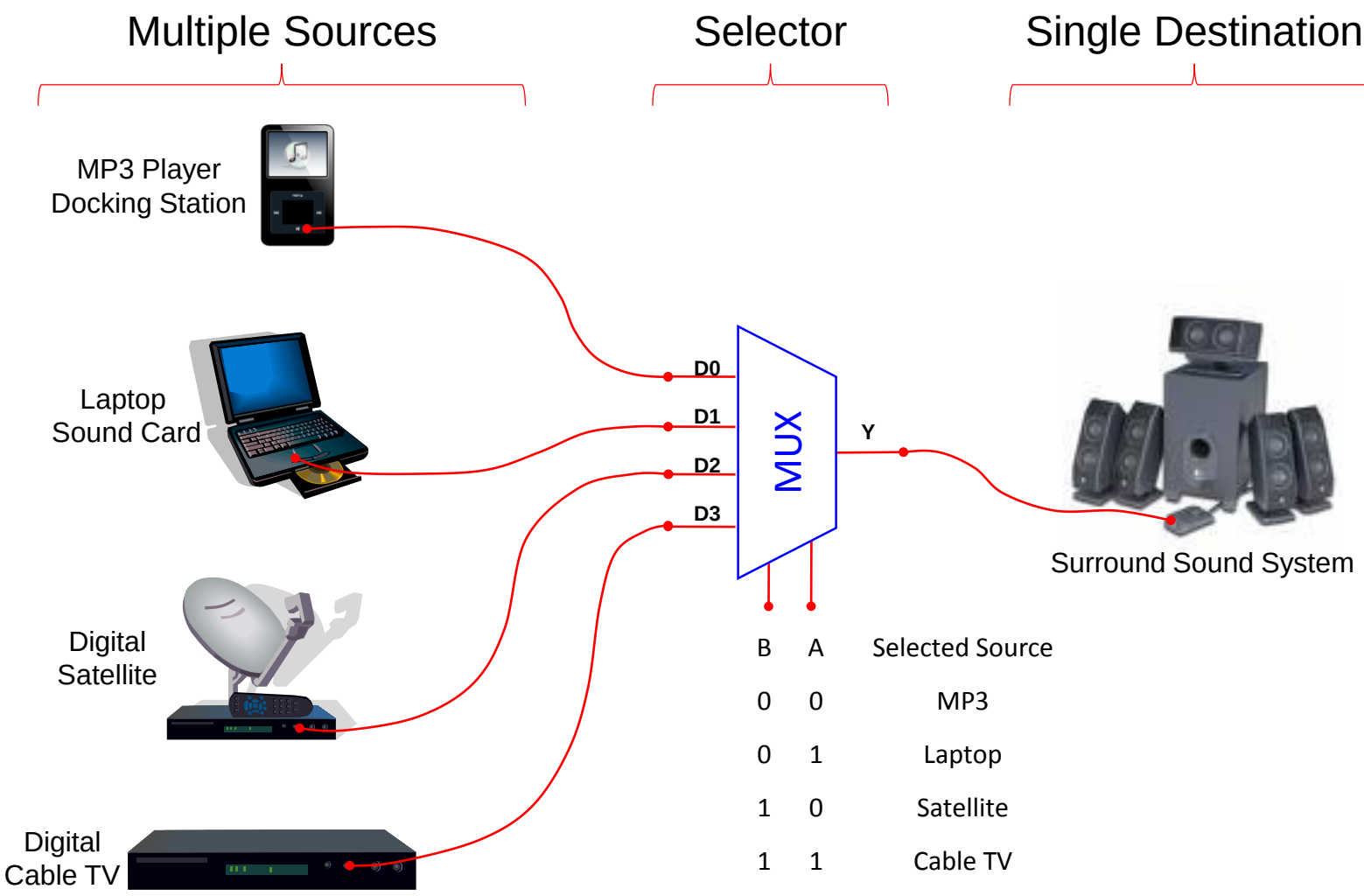
Multiplexer

What is a Multiplexer (MUX)?

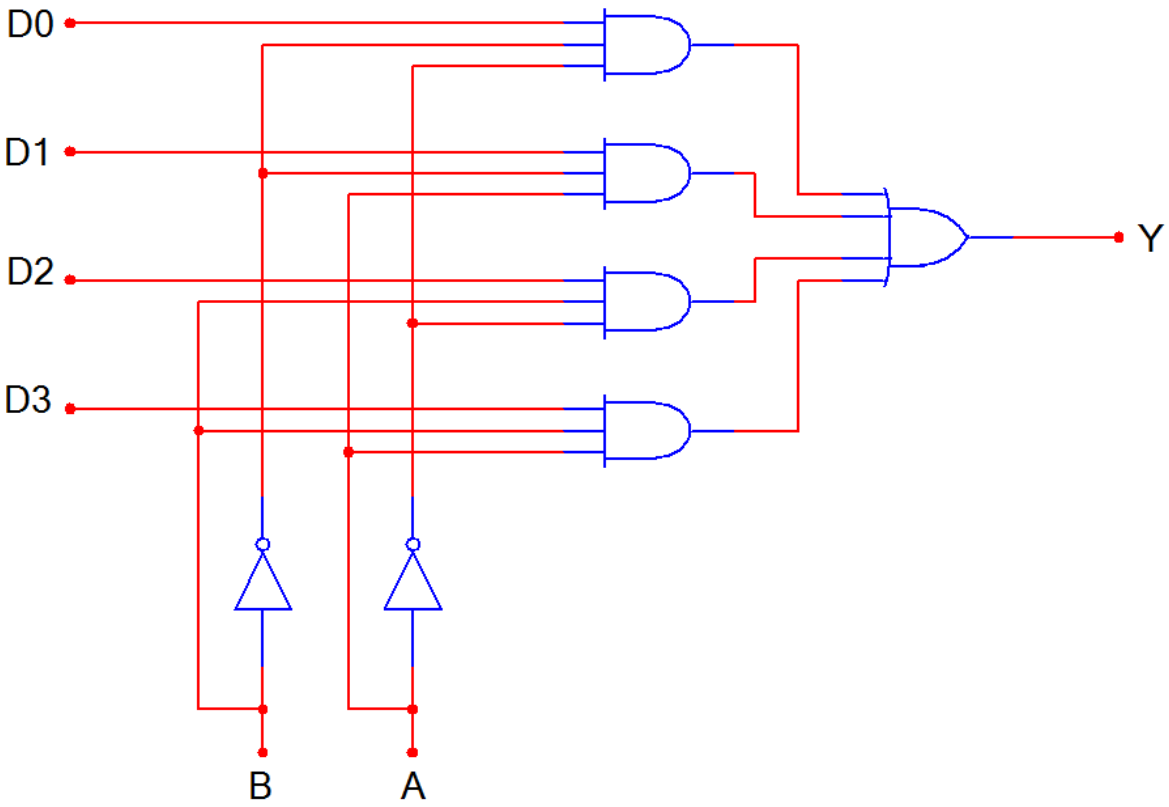
- A MUX is a digital switch that has multiple inputs (sources) and a single output (destination).
- The select lines determine which input is connected to the output.
- MUX Types
  - → 2-to-1 (1 select line)
  - → 4-to-1 (2 select lines)
  - → 8-to-1 (3 select lines)
  - → 16-to-1 (4 select lines)

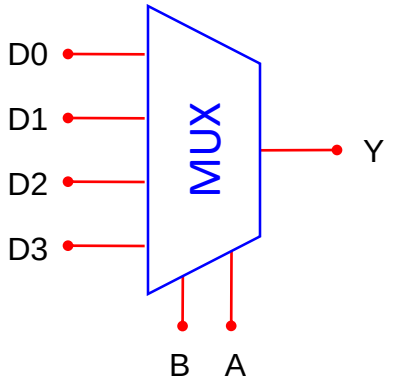


Typical Application of a MUX



4-to-1 Multiplexer (MUX)



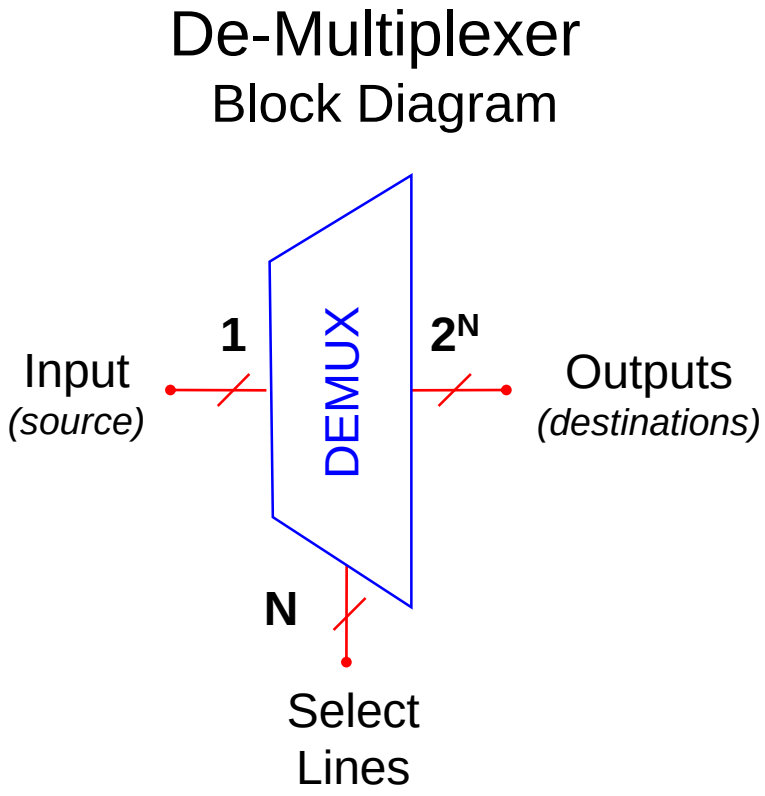


B	A	Y
0	0	D0
0	1	D1
1	0	D2
1	1	D3

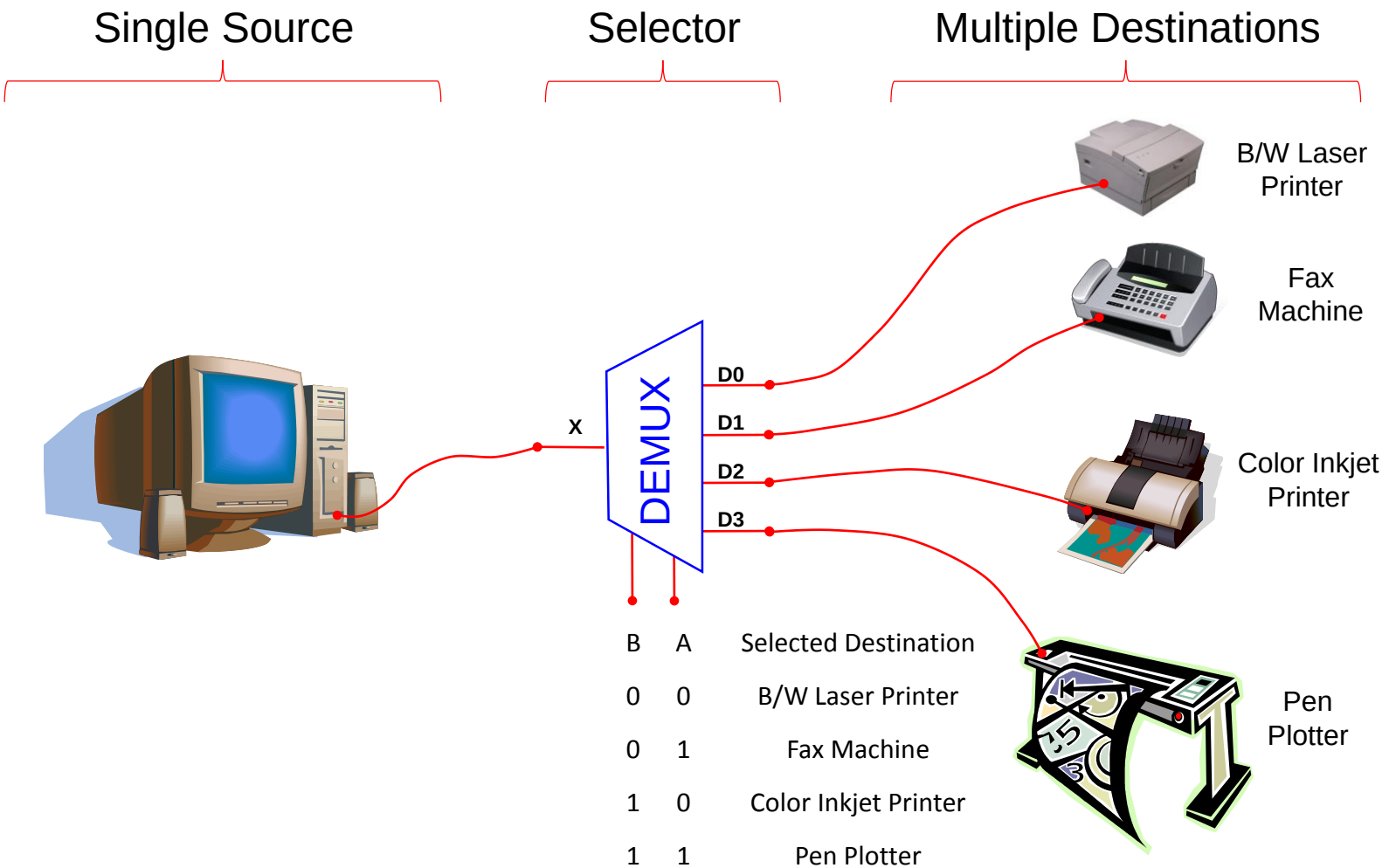
De-Multiplexer

What is a De-Multiplexer (DEMUX)?

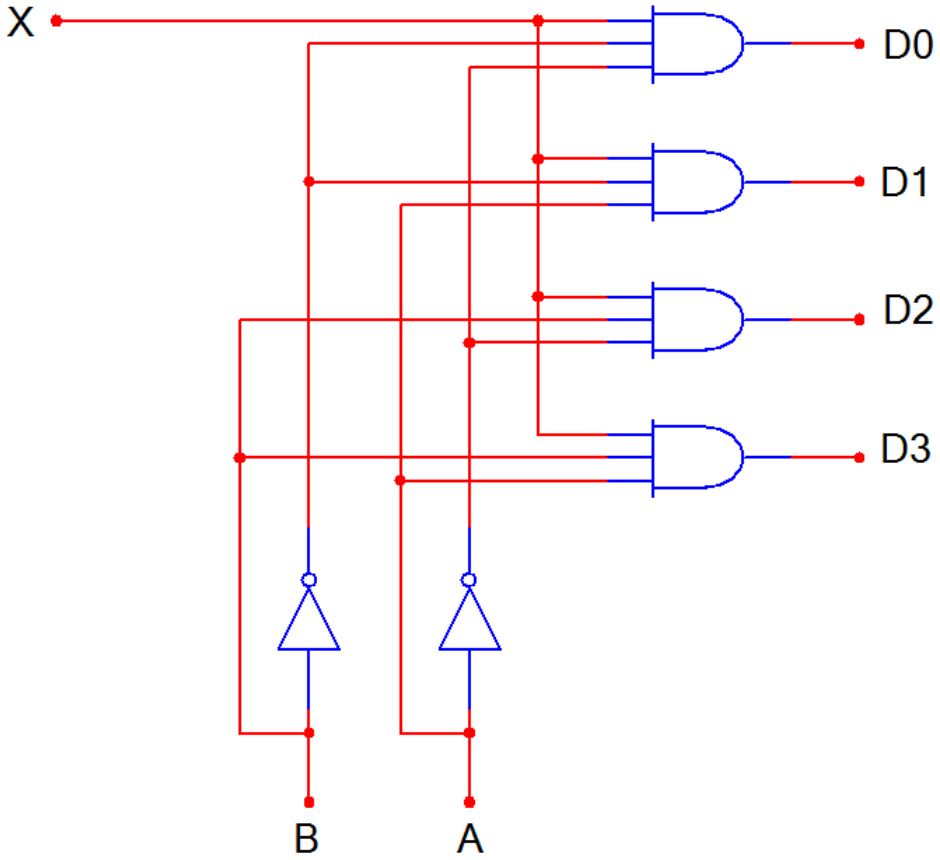
- A DEMUX is a digital switch with a single input (source) and a multiple outputs (destinations).
- The select lines determine which output the input is connected to.
- DEMUX Types
  - → 1-to-2 (1 select line)
  - → 1-to-4 (2 select lines)
  - → 1-to-8 (3 select lines)
  - → 1-to-16 (4 select lines)

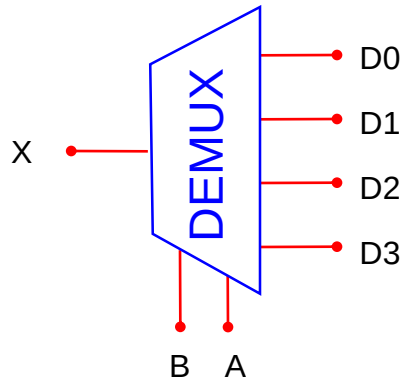


Typical Application of a DEMUX



1-to-4 De-Multiplexer (DEMUX)





B	A	D0	D1	D2	D3
0	0	X	0	0	0
0	1	0	X	0	0
1	0	0	0	X	0
1	1	0	0	0	X

Thanks