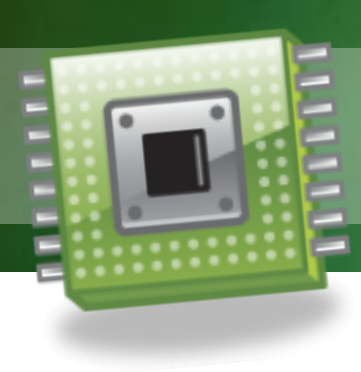
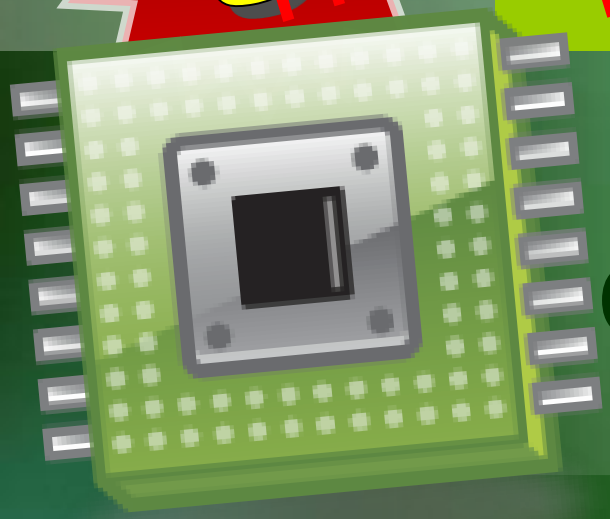


Combinational Logic Functions

- Data Selectors
  - Multiplexers (Data Selectors)
  - Demultiplexers
- Others
  - Comparators
  - Parity Generators / Checkers

WEEK 8

EMT 125/3
DIGITAL ELECTRONIC PRINCIPLES



COMBINATIONAL LOGIC FUNCTIONS

CONVERTERS (Encoder)

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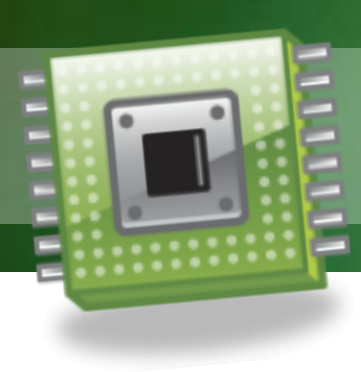
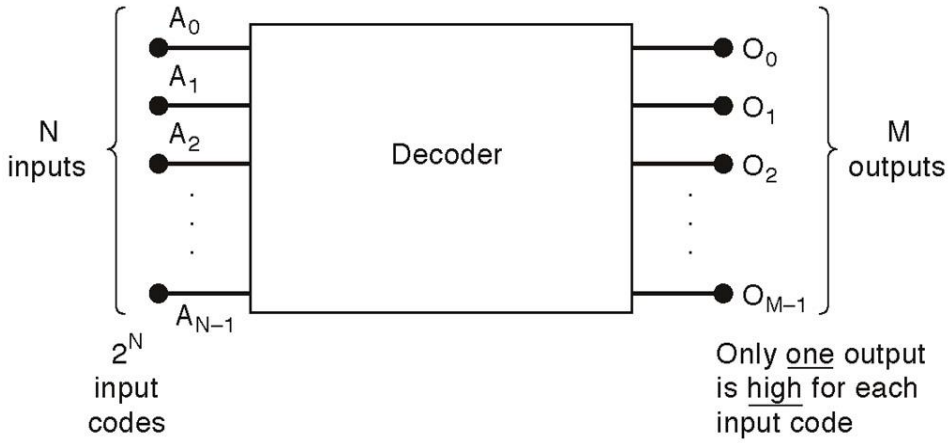


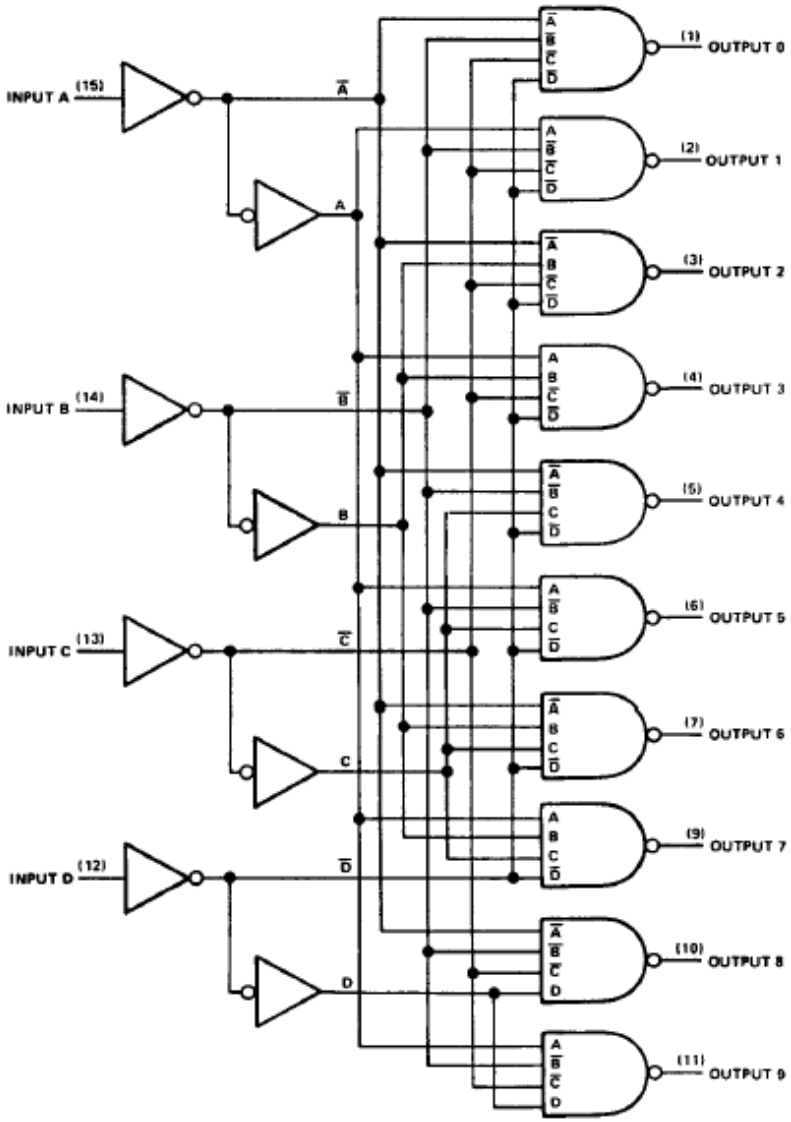
Exercise

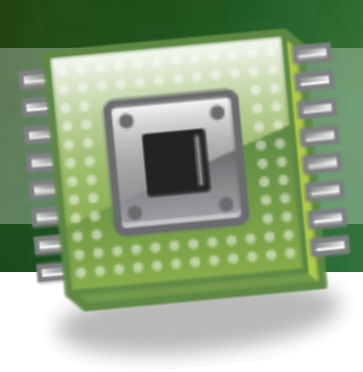
- Construct a 16-to-4-line Encoder

Decoders

- A decoder is a circuit that creates an output based on the binary states of a given input
- Selects one of several output lines, based on a coded input signal.
- Do the opposite of encoder







Decoders

- Decoders come in two varieties:
  - active high
  - active low

- We focus our lectures on **active high decoders:**
  - the selected output goes to logic 1
  - the outputs not selected stay at logic 0.

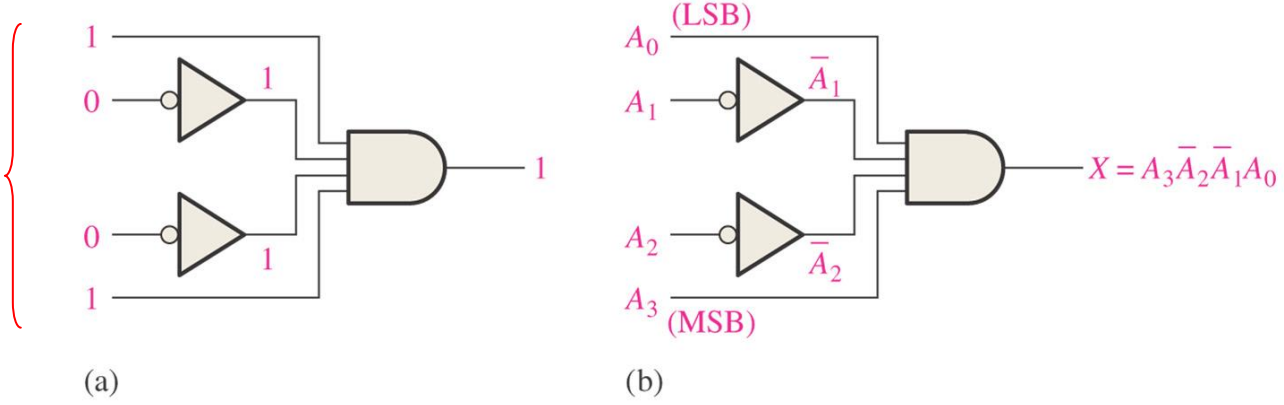
Decoder

Basic Binary Decoder

Example:

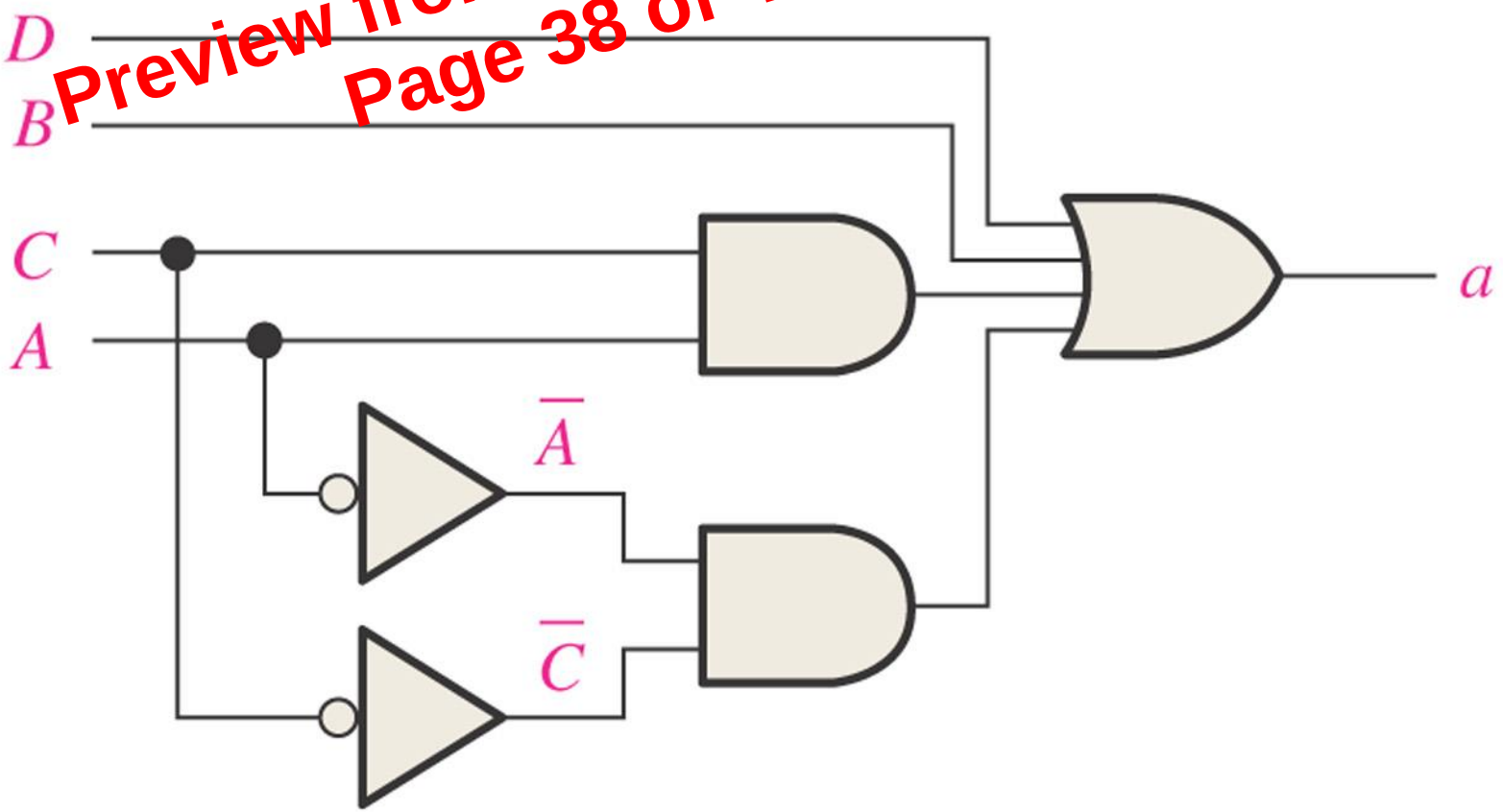
- To determine when a binary 1001 occurs on the input of a digital circuit, AND gate can be used as the basic decoding element.
- AND gate -> produce HIGH output when all inputs are HIGH
- How to ensure that inputs to the AND gate are HIGH when binary 1001 occurs?

Other than this input combinations, the output is 0



Decoding logic for the binary code 1001 with an active-HIGH output.

Design Example



The minimum logic implementation for segment a of the 7-segment display