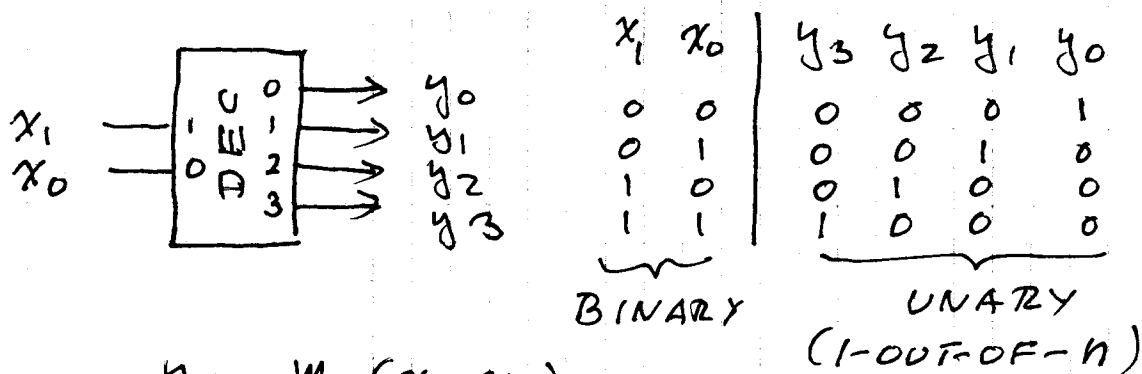


OVERVIEW OF MAIN COMBINATIONAL MODULES

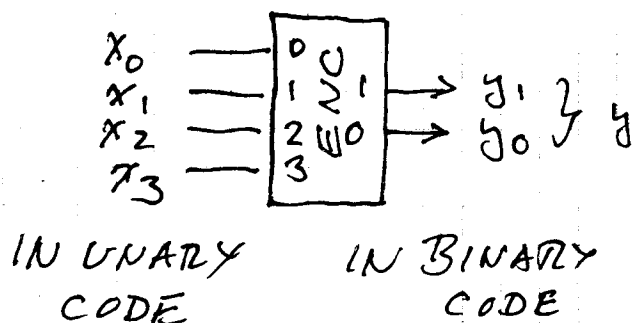
1. DECODER



$$y_i = m_i(x_1, x_0)$$

BINARY DECODER OF k INPUTS,
PRODUCES 2^k OUTPUTS, CORRESPONDING
TO ALL MINTERMS.

2. ENCODER

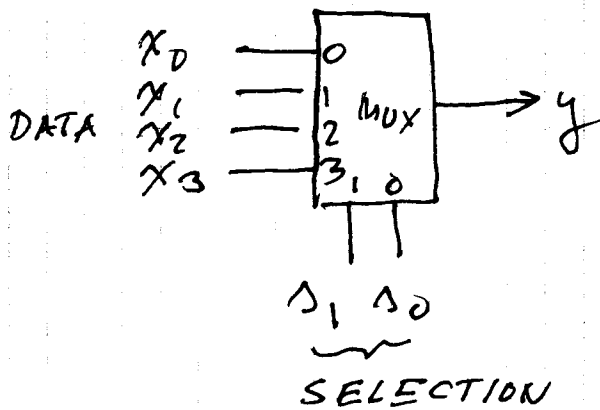


$$y = i \text{ IF } x_i = 1, i \in \{0, 1, 2, 3\}$$

INDEX OF INPUT
WITH VALUE 1

3. MULTIPLEXER

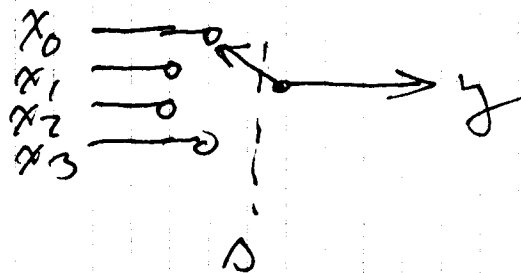
— DATA ROUTING



$$\Delta = 2\Delta_1 + \Delta_0 \in \{0, 1, 2, 3\}$$

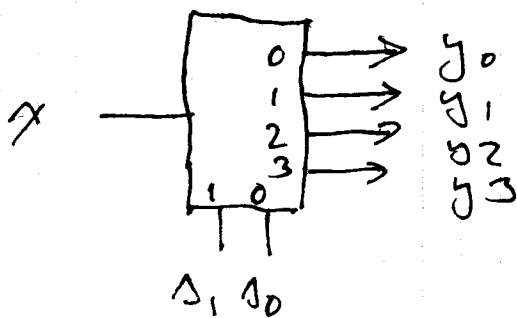
$$y = x_\Delta$$

SWITCH EQUIVALENT:



4. DEMULTIPLEXER

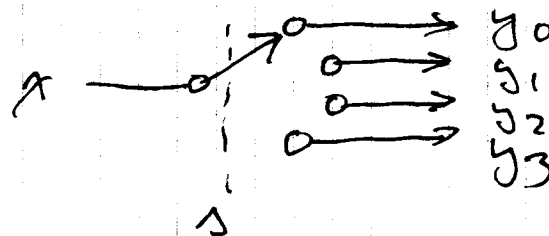
— DATA ROUTING



$$\Delta = 2\Delta_1 + \Delta_0 \in \{0, 1, 2, 3\}$$

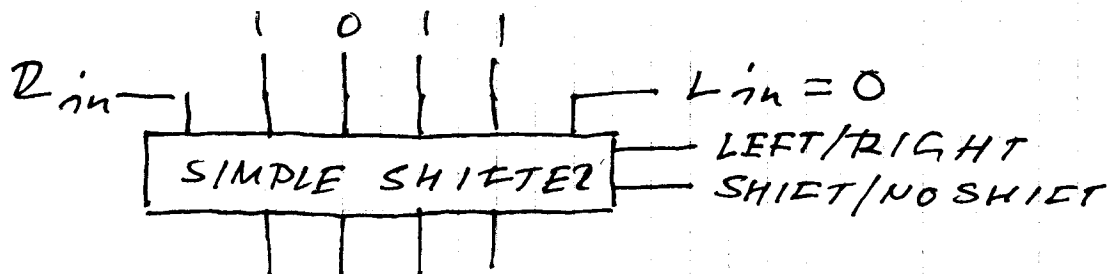
$$y_\Delta = x$$

SWITCH EQUIVALENT:



5. SHIFTER

— BIT-VECTOR MOVEMENT



LEFT SHIFT WITH
0 INSERT