

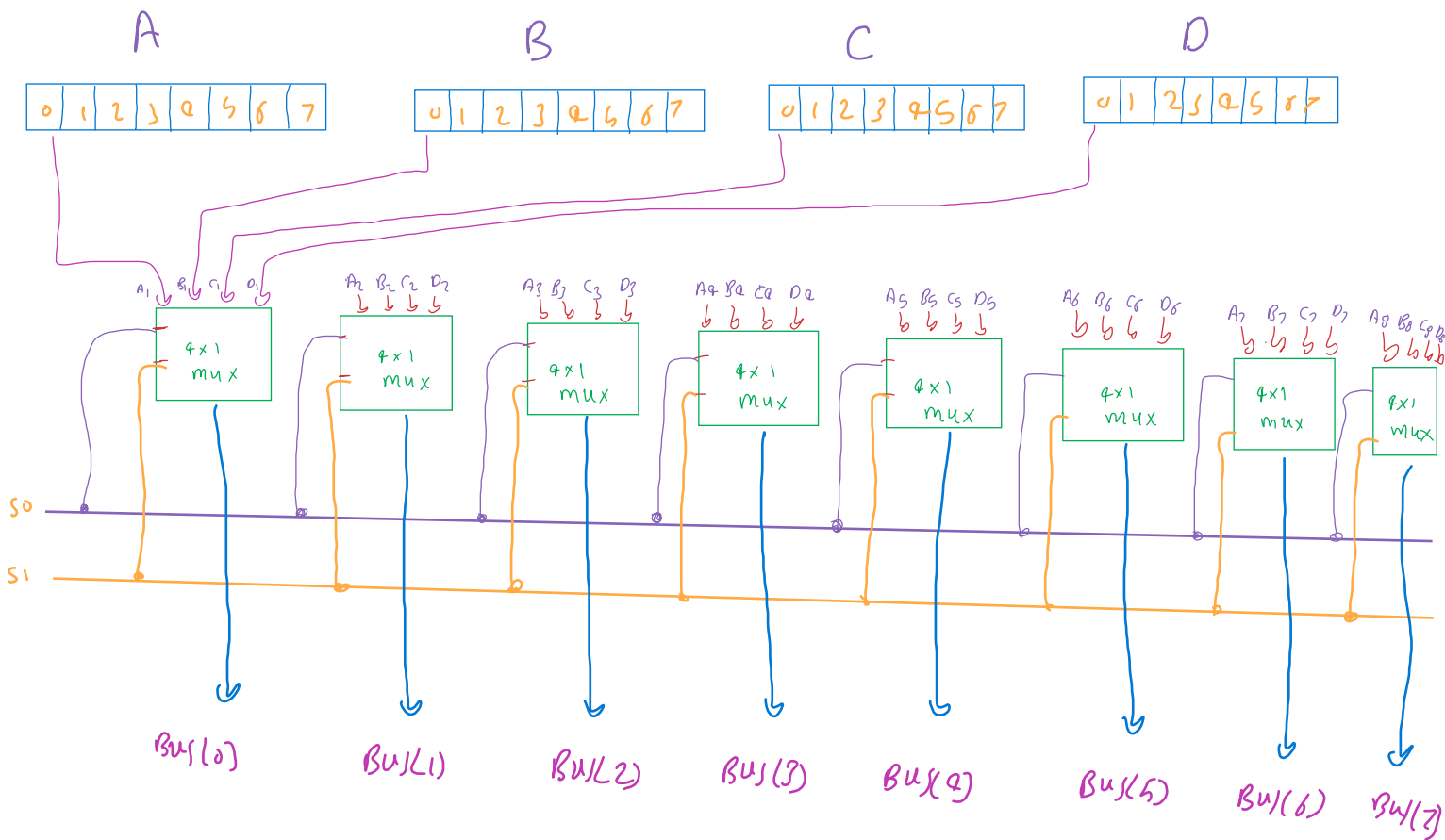
Assignment 1

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A digital computer has a common bus system for 4 registers (A, B, C, D) of 8 bits each.

- Construct the common bus system with multiplexers; show their inputs and their selection variables (S0, S1).
- Draw a diagram of a bus system, using three-state buffers and a decoder.

a)



- selection input number of each multiplexer = \log_2 {number of registers}
- size of each multiplexer = number of registers
- number of multiplexers = size of each register

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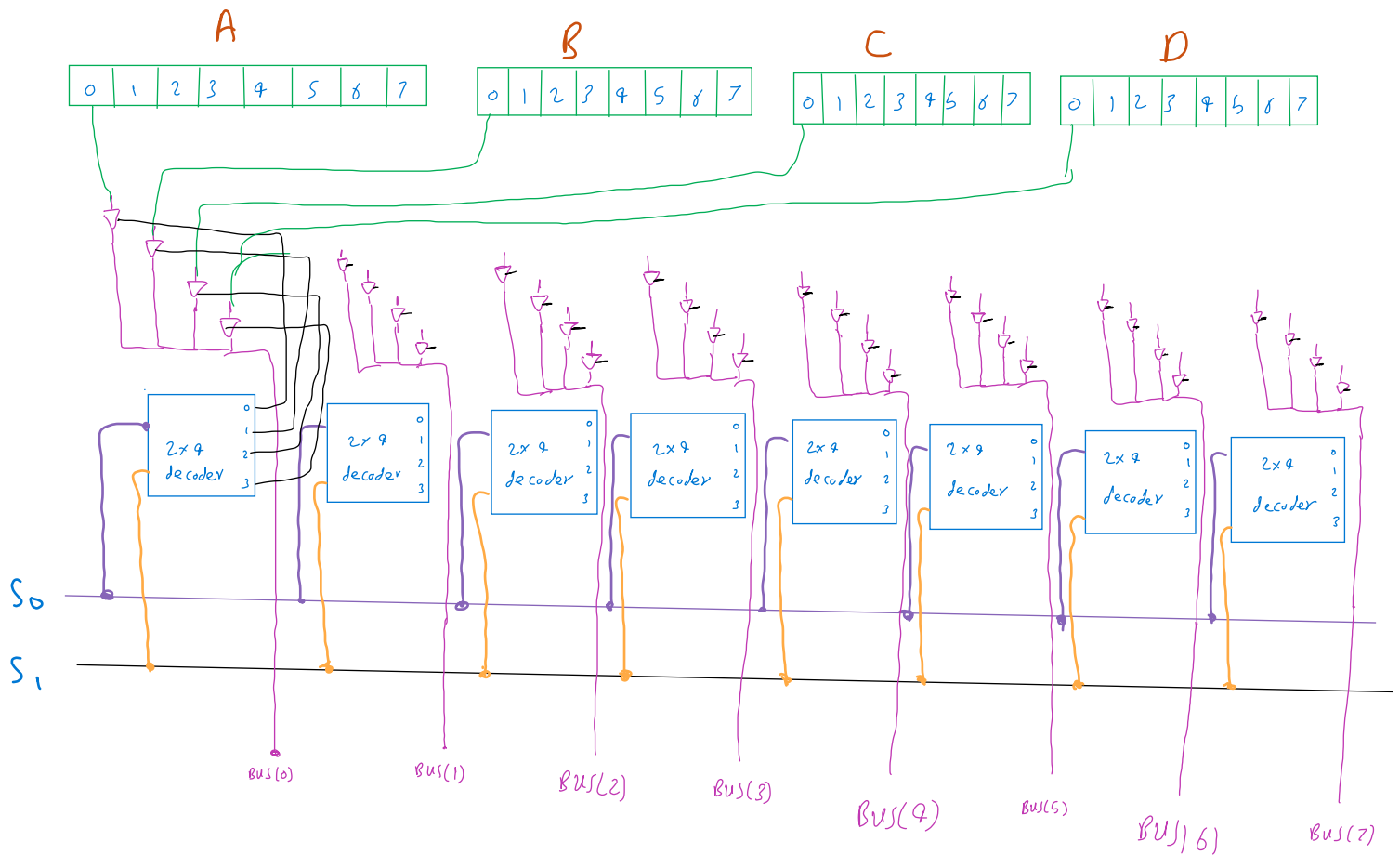
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(b) using Tri-state buffer and decoder

4 registers A, B, C, D register size = 8-bit



- Selection input number of each multiplexer = $\log_2[\text{number of registers}]$
- Size of each multiplexer = number of register
- Number of multiplexer = size of each register

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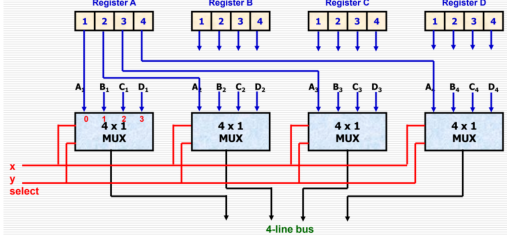
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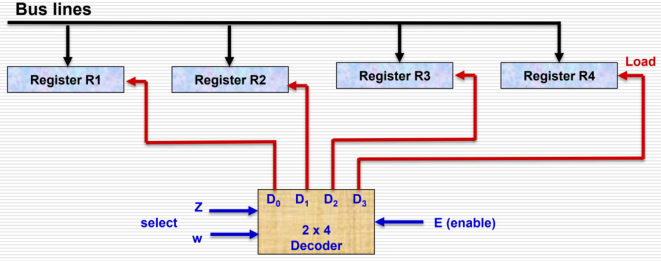
Transfer From a register to bus: BUS ← R

Using Multiplexer

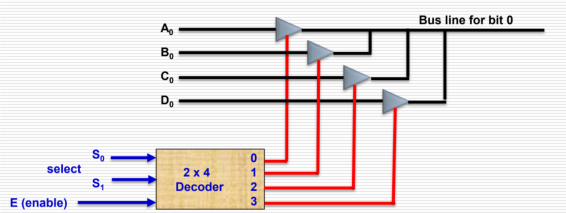


x	y	Register selected
0	0	A
0	1	B
1	0	C
1	1	D

Transfer From a bus to a destination register: R ← BUS



Using Three-State Bus Buffers



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