

CS 315-01 Decoder ROM Encoder

Today

ROMs Instruction Memory

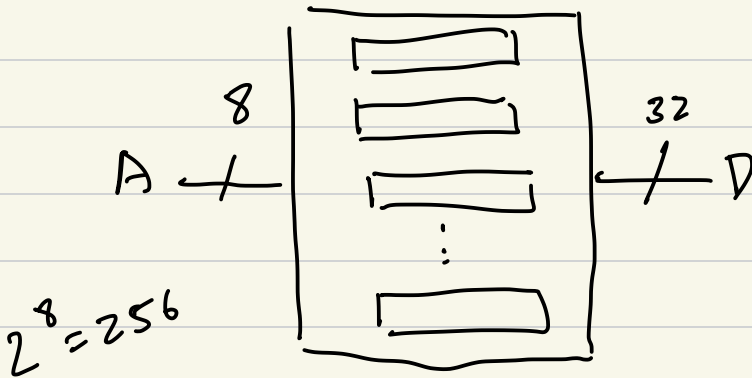
Decoder

Priority Encoder

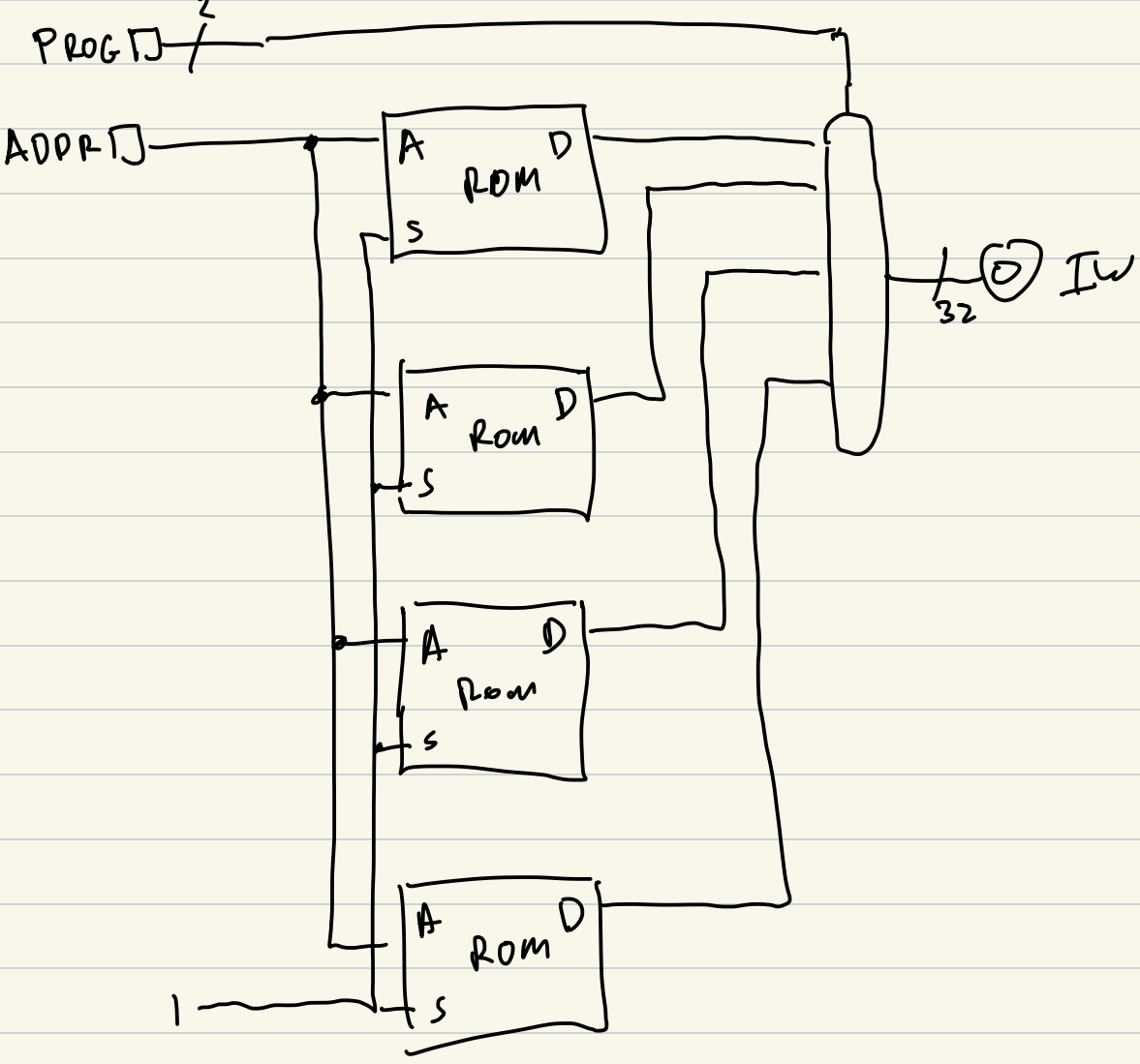
Instruction decoding

RAM?
Random Access
Memory

ROM Read Only Memory



Instruction Memory

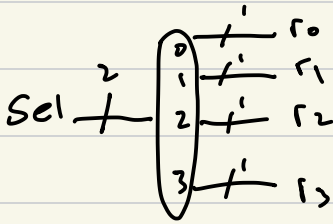


Decoder

2 to 4 decoder

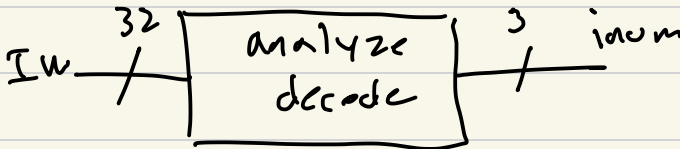
3 to 8

4 to 16



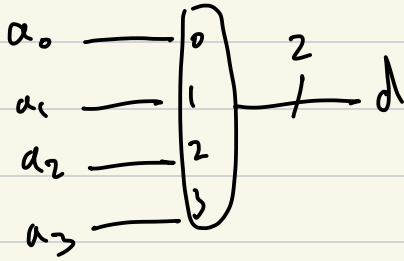
S_1	S_0	r_3	r_2	r_1	r_0	
0	0	0	0	0	1	$r_0 = (\bar{S}_1 \cdot \bar{S}_0)$
0	1	0	0	1	0	$r_1 = (\bar{S}_1 \cdot S_0)$
1	0	0	1	0	0	$r_2 = (S_1 \cdot \bar{S}_0)$
1	1	1	0	0	0	$r_3 = (S_1 \cdot S_0)$

Instruction decoder



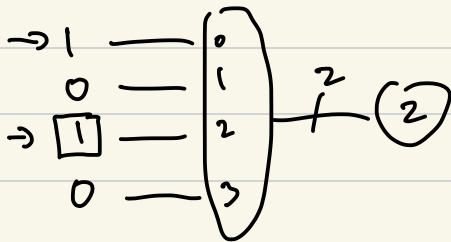
- | | | | | |
|---|-------|---|-------|-------|
| 0 | itype | 4 | btype | |
| 1 | rtype | 5 | jal | |
| 2 | load | 6 | j | |
| 3 | stype | 7 | jalr | |
| | | | | total |

Encoder



a_3	a_2	a_1	a_0	d_1	d_0
0	0	0	1	0	0
0	0	1	0	0	1
0	1	0	0	1	0
1	0	0	0	1	1

Priority Encoder



analyze decode
splitters

constant value

Priority Encoder

