

Dæmaskammtur 7

7.1 The memory units that follow are specified by the number of words times the number of bits per word. How many address lines and input-output data lines are needed in each case?

a) $8K \times 16$

Register = a set of flip-flops, together with gates that implement their state transitions.

Counter = Register that goes thru a predetermined sequence of states upon the application of clock pulses.

a) Number of words = $8k$ (minnishölf) $2^{33} = 85k$

Number of bits per word = 16 (Biti, 2 Byte) \rightarrow Ad minnst kosti 33 vistfangslínur

b) $2G \times 8$ $2^{31} = 2.147.483.648 = 2G$ minnishölf

\rightarrow Ad minnst kosti 31 vistfangslínur

c) $16M \times 32 \rightarrow 2^{24} = 16,777,216M \rightarrow$ Ad minnst kosti 24 vistfangslínur

d) $256k \times 64 \rightarrow 2^{18} = 262,144k \rightarrow$ Ad minnst kosti 18 vistfangslínur

7.2 Give the number of bytes stored in the memories listed in 7.1.

a) $16 \text{ bits} = 2 \text{ bytes}$ b) $8 \text{ bits} = 1 \text{ byte}$ c) $32 \text{ bits} = 4 \text{ bytes}$ d) $64 \text{ bits} = 8 \text{ bytes}$

7.A1 Útfærðu með PROM, rás sem tekur inn binary tölurnar 0 til 7, og bætir við tölunni +2 fyrir tölur sem 3 og minna, og bætir við +5 við tölur sem eru stærra en 4.

a) Útfærðu PROM sannleikstöflu:

	Inputs							Outputs					
	I_4	I_3	I_2	I_1	I_0			A_4	A_3	A_2	A_1	A_0	
0	0	0	0	0	0	\rightarrow	00010	(2)					
1	0	0	0	0	1	\rightarrow	00011	(3)					
2	0	0	0	1	0	\rightarrow	00100	(4)					
3	0	0	0	1	1	\rightarrow	00101	(5)					
4	0	0	1	0	0	\rightarrow	01001	(9)					
5	0	0	1	0	1	\rightarrow	01010	(10)					
6	0	0	1	1	0	\rightarrow	01011	(11)					
7	0	0	1	1	1	\rightarrow	01100	(12)					
8	0	1	0	0	0								
9	0	1	0	0	1								
10	0	1	0	1	0								
11	0	1	0	1	1								
12	0	1	1	0	0								
13	0	1	1	0	1								

b) Hvað þarf stórt PROM?

$$2^k \times n = 8 \times 16 ?$$

c) Teiknum PROM útfærslu:

