Internal Memory

HAMMING CODE
↳ to check error for data
↳ 9. Suppose an 8 bit data word stored in memory is 11000010. Using the Hamming algorithm, determine what check bits would be stored in memory with the data word. Show how you got your answer.

calculate parity bit, P needed

$$2^P \geq m + P$$

number of bits ← / → number of redundant bits

from msb →

1	2	3	4	5	6	7	8	9	10	11	12
P_1	P_2	1	P_3	1	0	0	P_4	0	0	1	0

2^0 2^1 2^2 2^3 } original bits + parity bits

$$2^4 \geq 8 + 4$$
$$16 \geq 12$$

* in reverse   * default even parity bits   add to become even ↓

	C_1	C_2	C_3	C_4	
0	0	0	0	0	0
1	0	0	0	1	1 need 1 to become even ↑
2	0	0	1	0	1
3	0	0	1	1	0 → need 0 to become even
4	0	1	0	0	1
5	0	1	0	1	0
6	0	1	1	0	0
7	0	1	1	1	1
8	1	0	0	0	1

* only till 8 bcs og bit = 8

1 0 0 1

$P_1 = C_4(1,3,5,7) \quad \Rightarrow 1001 = 0 \text{ (even)}$

$P_2 = C_3(2,3,7,8) \quad \Rightarrow 1001 = 0 \text{ (even)}$

$P_3 = C_2(4,5,6,7) \Rightarrow 0001 = 1 \text{ (odd)}$ ⎤ nnti aah ?

$P_4 = C_1(8) \qquad \Rightarrow 0 \qquad = 0 \text{ (even)}$ ⎦ tanya

P_1 P_2 P_3 P_4

$\Rightarrow 0 \; 0 \; 1 \; 1 \; 1 \; 0 \; 0 \; 0 \; 0 \; 1 \; 0 \;_2$