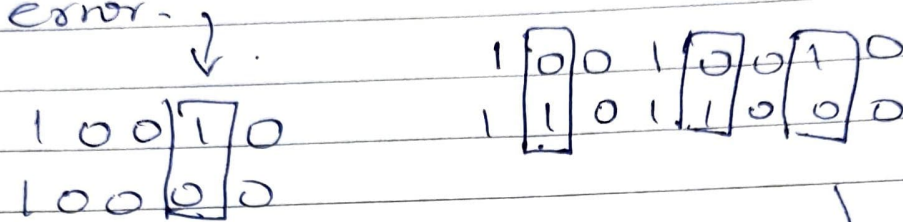


# Error detection and correction

## Types of error.

Single bit error - Burst error (or) Multiple error.



## Error detection Methods

## Error correction

① Simple Parity check

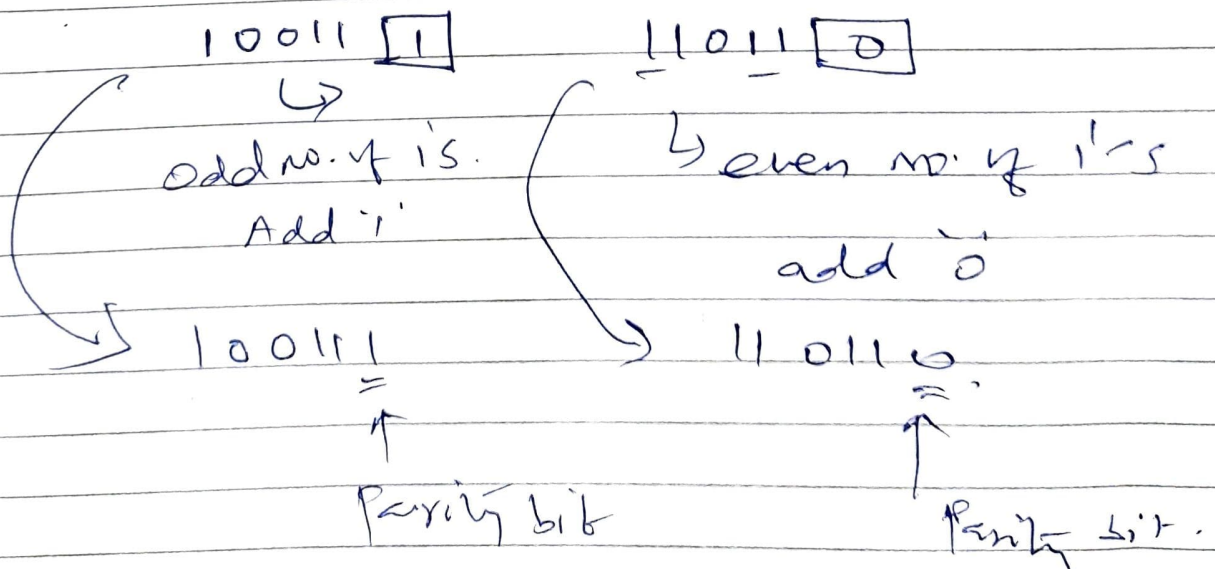
Hamming code

② 2'D. Parity check

③ Check sum

④ cyclic Redundancy check

①-



# Original data

10011001 11100010 00100100 10000100

Calculating Parity

1	0	0	1	1	0	0	1	0
1	1	1	0	0	0	1	0	0
0	0	1	0	0	1	0	0	0
1	0	0	0	0	1	0	0	0

Row Parity

1 1 0 1 1 0 1 1 0

Column Parity

## 3) Check Sum

For side

10110011 (1) 10101011 (2) 01011010 (3) 11010101 (4)

(1)

10110011

(2)

10101011

10101110  
1

01110000

1's side

(3)

01011111

01011010

(4)

10111001

11010101

1

10001110

1

10001111

1's complement

10001111

10001111

01110000

11111111

00000000

1's comp

no error

(4) CRC

Divisor - 1001

Dividend - 1011 (- Appended to  $n-1$  bits) $4-1 = 3$  bits added

$$\begin{array}{r}
 1011 \overline{) 1001000} \\
 \underline{1011} \phantom{00} \downarrow \text{XOR operation} \\
 001000 \\
 \underline{1011} \phantom{00} \downarrow \\
 00110 \\
 \underline{1011} \phantom{00} \downarrow \\
 00110
 \end{array}$$

Data.  $\rightarrow$  Left Significant bit of remainder = 0

$$\boxed{1011 \mid 110}$$

for size

$$\begin{array}{r}
 1011 \overline{) 1001110} \\
 \underline{1011} \phantom{00} \downarrow \downarrow \\
 001011 \\
 \underline{1011} \phantom{00} \downarrow \downarrow \\
 00000 \Rightarrow \text{Remainder}
 \end{array}$$

 $\rightarrow$  no error