Parity method for error detection :

During data transmission from a transmitter to a receiver, electrical noise can corrupt the transmission signal. If the noise is substantial, it can alter the logic level of the signal, introducing errors in the transmitted signal. A parity bit is an extra 0 or 1 bit that is attached to the original signal and used to detect errors.

There are two parity methods, even and odd. In the even parity method, the value of the bit is chosen so that the total number of 1s in the transmitted signal, including the parity bit, is even. Similarly, with odd parity, the value of the bit is chosen so that the total number of 1s is odd. For example, for the following byte 11010000, the even parity bit would be 1, making the total number of 1s in the signal even, and the odd parity bit would be 0, making the total number of 1s in the signal odd.

Even parity(ep) : makes the total no. of 1's even

Odd parity (op): makes the total no. of 1's odd

number	even P	odd P
0000	0	1
0001	1	0
0010	1	0
0011	0	1
0100	1	0
0101	0	1
0110	0	1
0111	1	0
1000	1	0
1001	0	1
1010	0	1
1011	1	0
1100	0	1
1101	1	0
1110	1	0
1111	0	1

EX: Check an even parity(ep) and odd parity(op) for the following numbers:

      0101,   0001

For   0101   ep=0, op=1
For   0001   ep=1, op=0

For Even Parity Checking

Please note that, in even parity checking, our target is to make even number of 1's in code word generate.

Data	1's in Data	P	Total 1's	Code word
1010110	4	0	4	10101100
0101111	5	1	6	01011111
0000000	0	0	0	00000000
1001100	3	1	4	10011001
1111111	7	1	8	11111111

For Odd Parity Checking

Please note that our target is to make odd number of 1's in code word generated in odd parity checking.

Data	1's in Data	P	Total 1's	Code word
0110101	4	1	5	01101011
0101111	5	0	5	01011110
0000000	0	1	1	00000001
1011000	3	0	3	10110000
1111111	7	0	7	11111110

Performance of Parity check

- A redundancy of "n" bits can easily detect a burst error of "n" bits. Thus, it increases the likelihood of detecting burst errors.
- There is however one pattern of errors that remain elusive. If 2 bits in one data unit are damaged, the checker will not be able to detect errors.

So, this was all about error detection using parity check, we will get acquainted with checksum error detection technique in the next tutorial.