

## Check sum

Checksum is the one of the method used for error detection, based on the concept of redundancy.

In this mechanism, the unit is divided into **K sections**, each of **n bits**. All sections are added using ones complement to get the sum.

This is complemented and becomes the **check sum**. There after this check sum is sent with the data.

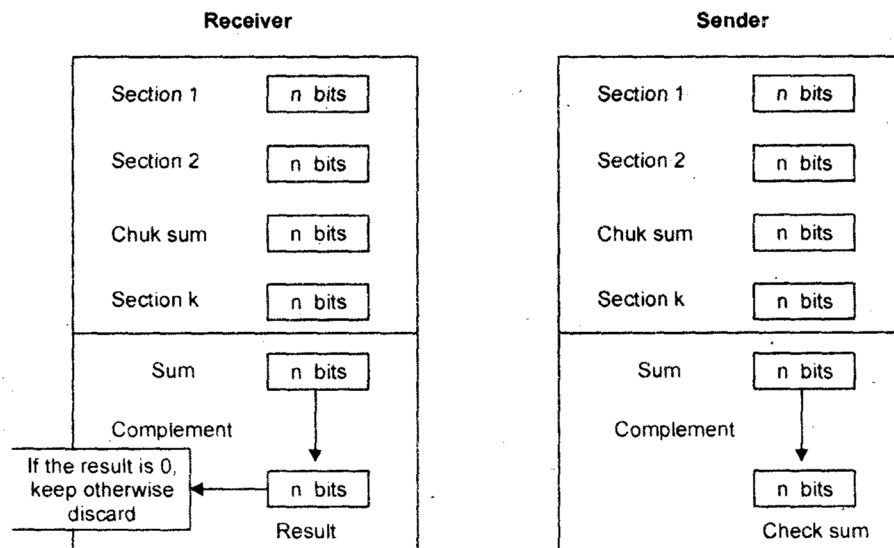
At the receiver side the unit is divided into **K sections each of n bits**. All sections are added using ones complement to get the sum. The sum is complemented. If the result is **zero** data are **accepted** otherwise **rejected**.

### How check sum method works of error detection:

Checksum is the mechanism for error detection which is also based on the concept of redundancy.

### Check sum Generator

In the sender, the check sum generator subdivides the data unit into equal segments of n bits. These segments are added using ones complement arithmetic in such a way



that the total is also n bits long. That total is then complemented and appended to the and o the original data unit as redundancy bits called the check sum field. The extended data unit is transmitted across the network. So if the some of data segment is T, the checksum will be T.

## Check sum Checker

The receiver subdivides the data unit as above and adds all segments and complements the result. If the extended data unit is intact, the total value found by adding the data segments and the check sum field should be zero. If the result is not zero, the packet contains an error and the receiver rejects it.

### Example

← 10101001                      00111001

Ans. Sender

The numbers are added using one's complement arithmetic

	10101001	
	00111001	
Sum	11100010	
Check sum	00011101	(1's Complement)
the pattern unit is		
← 10101001	00111001	00011101
		<b>checksum</b>

Receiver

10101001	00111001	00011101
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When the receiver adds the three sections, it will get all 1s, which after complementing is all 0's and shows that there is no error.

	10101001
	00111001
	00011101
Sum	11111111

Complement 00000000 means that the pattern is ok.

## Hamming Distance Code

The hamming code can be applied to data unit of any length and use the relationship between data and redundancy bits.

This method is used for error correction and always checks the distance between the data bit and reduce it.

It means detect error in data bits that does not match and throw it out from entire message.

Example:

1. Work

Walk .... Here distance is 2 bit changed

2. 2173896

2233796.... Here distance is 3 bit changed