

# DATA COMMUNICATION

This Chapter intends to create basic concepts of Data communication. We will be covering some basic definitions and details

## **Q1 : What is Data Transmission**

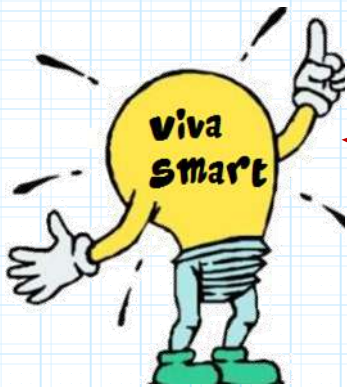
Ans: Data transmission is the moving of data in the form of any form signals across a transmission medium.

As an example, when you are collecting numerical statistics from another computer, sending animated pictures from a design workstation, or causing a bill to ring at a distant control center, at that movement you are facing data transmission.

## **Q2: What are the main types of Data in which normally it is transmitted**

Ans : Data is normally transmitted in two types:

1. Analogue Data via Analog Signal
2. Digital Data

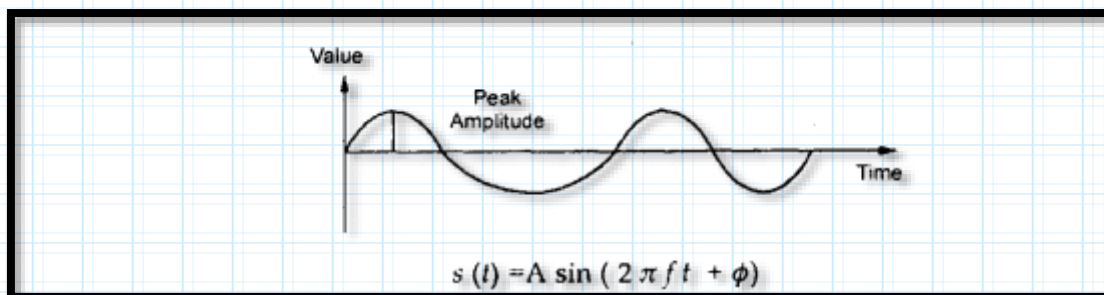


What is Analog Data and How a Analog signal is represented, and what are its important terms and Features

The method of Transmission in which we use or send **analog data** over transmission medium is called Analog Communication

As an example, Analog data is human voice. When someone speaks, an analog wave is created in the air. This can be captured by a microphone and converted to an analog signal.

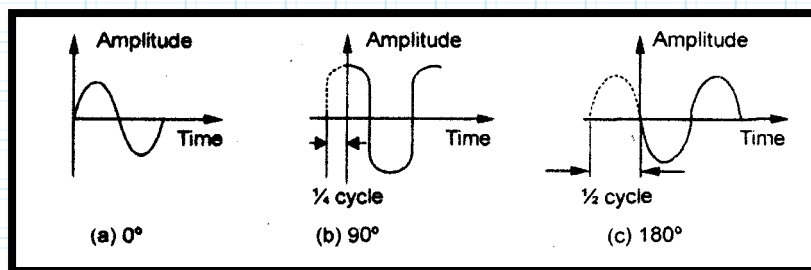
The **sine wave** is the most fundamental part of a **periodic analog signal**. It can be drawn as a simple oscillating curve, its change over the course of cycle is smooth and consistent, a continuous, rolling flow.



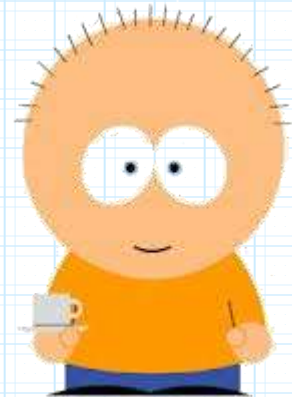
A = Amplitude    f = Frequency    phi = Phase

## Where

- Period is expressed in seconds.
- Frequency is formally expressed in hertz (Hz).
- Phase—the terms phase describe the position of the waveform relative to time zero
- Phase is measured in degrees or radians.

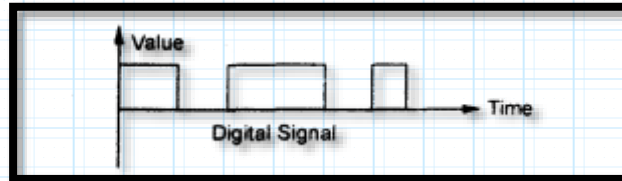


And What about Digital  
Data and Digital  
Transmission



The method of transmission in which we use or send digital data over transmission medium.

A signal that takes on only two values, off or on, typically represented by 0 and 1. Digital signals require less power but typically more bandwidth than analog



### Q: What is Bandwidth?

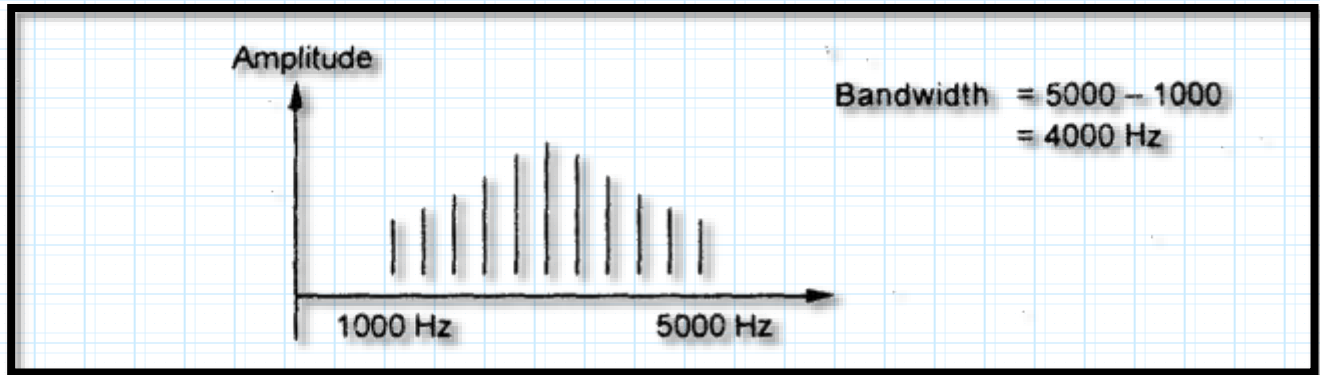
The amount of data that can be transmitted via a given communications Channel in a given unit of time.

Generally speaking "It exactly shows that how much stuff that you can send through a connection"



How is Band width represented for Digital and Analog Signal?

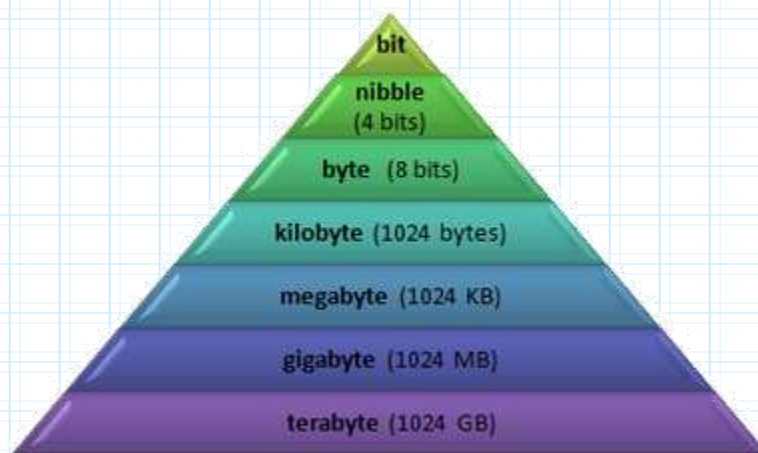
**Bandwidth or analog bandwidth**, frequency bandwidth or radio bandwidth: a measure of the width of a range of frequencies, measured in hertz



**Bandwidth (Digital)**, the rate of data transfer, bit rate or throughput, measured in bits per second (bps)

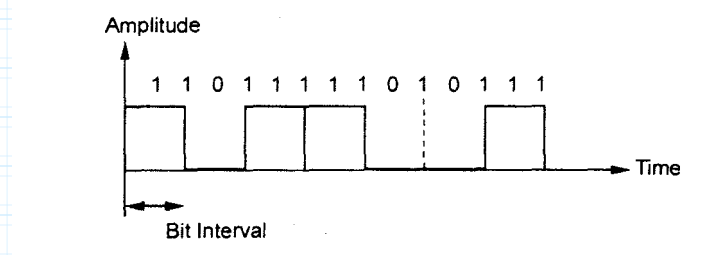
OR

The maximum number of bits of information which can be transmitted per seconds is data transmission link. Typically expressed as bits per second (bps). This shows the speed at which data can be transmitted between devices. This is sometimes referred to as though put. It can also be expressed in MBps.



## Q: Explain the terms bit rate and bit interval?

**Bit Interval**— the bit interval is the time required to send one single bit in a digital communication.



**Bit Rate**— the bit rate is the number of bit intervals per second.