What is a signal

Signal

Any measurable quantity that varies over time, space , or any other variable that orders or organizes these measurements.

Cibtinuous-time & discrete-time signals

Continuous time signal

$x(t)$ observed continuous over time

Discrete time signal

$x[n]$ observed at regularly space points in time (time-axis is discretized)

ex. audio is commonly recorded at $44.1kHz$. Thus, we have a new sample every $T = 1/44100$ seconds. T is called the **sampling period**.

$$x[n] = x(nT)$$

Continuous-valued & discrete-valued signals

Continuous valued signal

takes any possible continuous value for its measurements

Discrete valued signal

takes one of a finite number of pre=defined values. The measurements are said to be **quantized.**

Analog signal

a continuous-time and continuous-valued signal

Digital signal

discrete-time and discrete-valued signal

Why digital?