Signal

A function of one or more independent variable that represents some physical quantity.

The independent variable could be time, position, or something else.

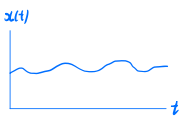
$v(x,y)$ — v: voltage; x: position; y: time; $v(x,y)$: signal

system

take in one or more signal to produce a new signal to produce some desired behaviour.

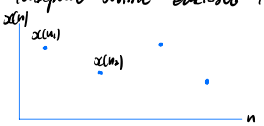
Countinous time signal

- when the independent variable is countinous
- independent variable enclosed in ()



discrete time signal

- when the independent variable is discrete.
- independ variable enclosed in [].



quantify most of the signal using power or energy.

For example the power and energy dissipated in a resistor.

signal → $p(t) = v(t)\, i(t) = \frac{(v(t))^2}{R}$

signal → $E(t) = \int_{t_1}^{t_2} p(t)\, dt$

Signal can also have independent variable that's takes on complex number.
signal can be complex number.