at least   100Hz

sampling frequency > double the frequency of the highest frequency component!   50Hz×2

frequency:
occurences of a repeating event per unit of time.
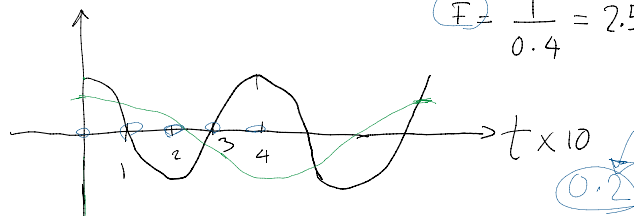
$f = \dfrac{1}{T}$ ← time of a period

sampling rate frequency > 100Hz
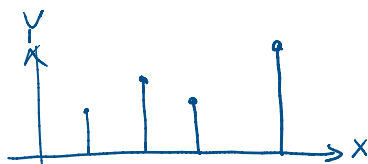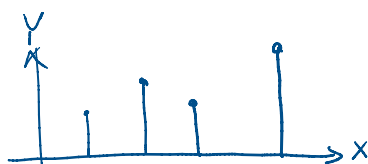
$\dfrac{1}{T} < \dfrac{1}{100} s = 0.01$

$T = 0.4$

$F = \dfrac{1}{0.4} = 2.5Hz$

$t \times 10$ 0.2

Sampling Rate > 5Hz

$T < \dfrac{1}{5} = 0.2$

linear line segment

linear interpolation

$F(x_1)$ $F(x_2)$

x_1 x_2

X
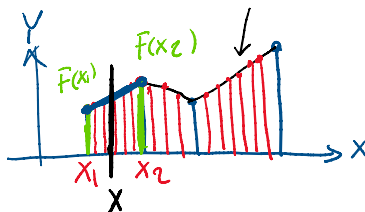
$$F(X) = \alpha\, F(x_1) + (1-\alpha)\, F(x_2) = \dfrac{x-x_2}{x_1-x_2} F(x_1) + \dfrac{x_1-x}{x_1-x_2} F(x_2)$$

$$F(x) = \alpha F(x_1) + (1-\alpha) F(x_2) = \frac{}{x_1 - x_2} F(x_1) + \frac{}{x_1 - x_2} F(x_2)$$

$$\boxed{x} = \alpha X_1 + (1-\alpha) X_2 \implies x = \alpha X_1 - \alpha x_2 + x_2$$

$$0 \leq \alpha \leq 1$$

$$x - x_2 = \alpha(x_1 - x_2)$$

$$\alpha = \frac{x - x_2}{x_1 - x_2} \implies$$

$$1 - \alpha = 1 - \frac{x - x_2}{x_1 - x_2} =$$

$$\frac{x_1 - x_2 - x + x_2}{x_1 - x_2} = \frac{x_1 - x}{x_1 - x_2}$$