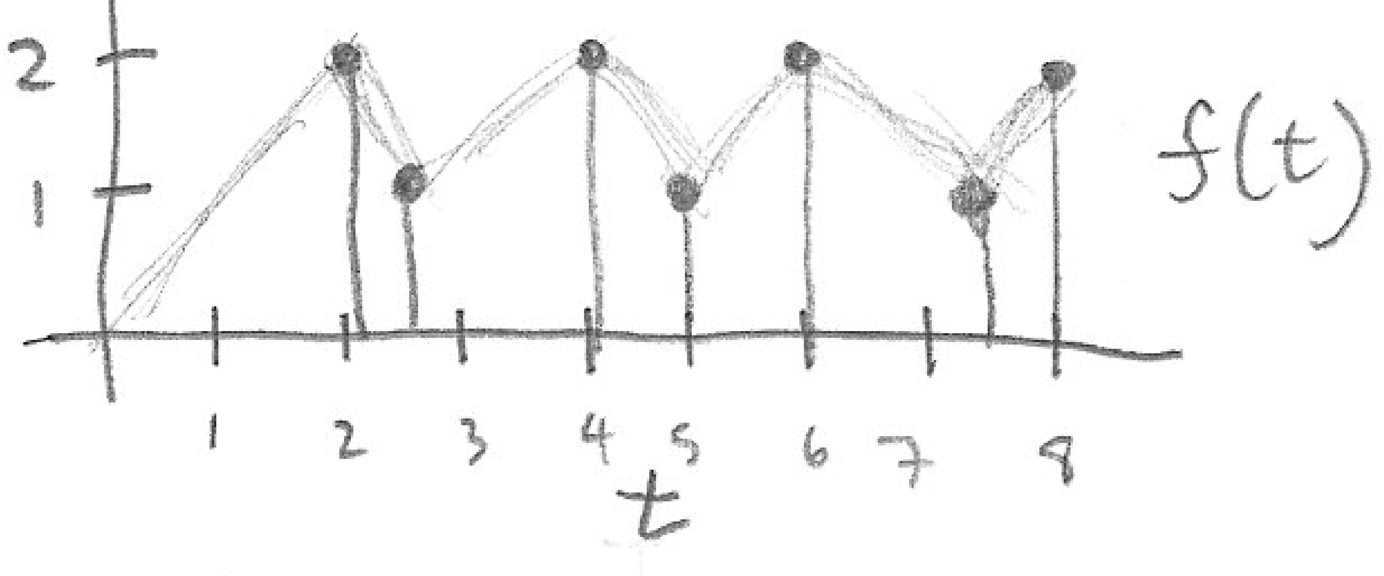
$F(\omega) = \int_{-\infty}^{\infty} f(t) e^{-j\omega t} dt$

example:



$$f(t) = 2\delta(t-2) + \delta(t-\tfrac{5}{2}) + 2\delta(t-4) + \delta(t-5) + 2\delta(t-6) + \delta(t-\tfrac{15}{2}) + 2\delta(t-8)$$

since $\int A\,\delta(t-\tau)\, e^{-j\omega t}\, dt = A e^{-\tau j\omega}$

and $\int \left(f(t_1) + f(t_2) \ldots\right) e^{-j\omega t} = \int f(t_1) e^{-j\omega t} dt + \int f(t_2) e^{-j\omega t} dt$

Then

$$\boxed{F(\omega) = \sum_{i=0}^{n} A(i)\, e^{-\tau(i) j\omega}}$$

where $A(i)$ is value of each sample "i", and $\tau(i)$ is time of each sample "i".

$$F(\omega) = 2e^{-2j\omega} + e^{-\frac{5}{2}j\omega} + 2e^{-4j\omega} \ldots$$

Good for transcribing to C++ code, where data collected are in form of a sum of impulse functions