Fourier Continued:

$$F(f) = \sum_{n=0}^{N-1} A_n \cdot e^{-j\frac{2\pi f t_n}{N}} \qquad a_n \qquad t_n = n \cdot \text{Sampling time}$$

N = samples

$$F_f = A_0 e^{-a_0 j} + A_1 e^{-a_1 j} + \ldots + A_n e^{-a_{N-1} j}$$

$$F_f = A_0 [\cos(-a_0) + j\sin(-a_0)] + \ldots$$

$$F_f = A_0\cos(a_0) + A_0 j\sin(-a_0) + \ldots\ldots$$

$$F_f = C_0 + D_0 j$$

↑ Amplitude at freqnency f

$$F_{f_{real}} = A_0 \cos\left(-\frac{2\pi f t_0}{N}\right) + A_1 \cos\left(-\frac{2\pi f t_1}{N}\right) + \ldots$$

$$F_{f_{real}} = \sum_{n=0}^{N-1} A_n \cos\left(-\frac{2\pi f t_n}{N}\right)$$