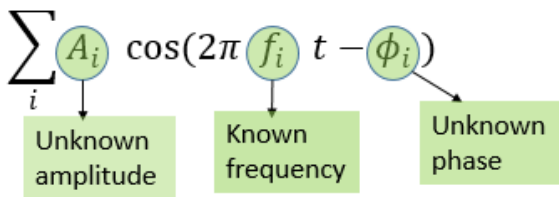


Prediction:

$$p(t) = \sum_i A_i \cos(2\pi f_i t - \phi_i)$$



Transformation:

$$p(t) = \sum_i \underbrace{A_i \cos \phi_i}_{C_i} \cos(2\pi f_i t) + \underbrace{A_i \sin \phi_i}_{S_i} \sin(2\pi f_i t)$$

Observation: o_1, o_2, \dots, o_M at time $t = 1, 2, \dots, M$

Linear regression model:

$\cos(2\pi f_1 * 1)$	$\sin(2\pi f_1 * 1)$...	$\cos(2\pi f_N * 1)$	$\cos(2\pi f_N * 1)$
$\cos(2\pi f_1 * 2)$	$\sin(2\pi f_1 * 2)$...	$\cos(2\pi f_N * 2)$	$\cos(2\pi f_N * 2)$
\vdots	\vdots	...	\vdots	\vdots
$\cos(2\pi f_1 * M)$	$\sin(2\pi f_1 * M)$...	$\cos(2\pi f_N * M)$	$\cos(2\pi f_N * M)$

$$\begin{matrix} \times & \begin{bmatrix} C_1 \\ S_1 \\ \vdots \\ C_N \\ S_N \end{bmatrix} & = & \begin{bmatrix} o_1 \\ o_2 \\ \vdots \\ o_M \end{bmatrix} \end{matrix}$$