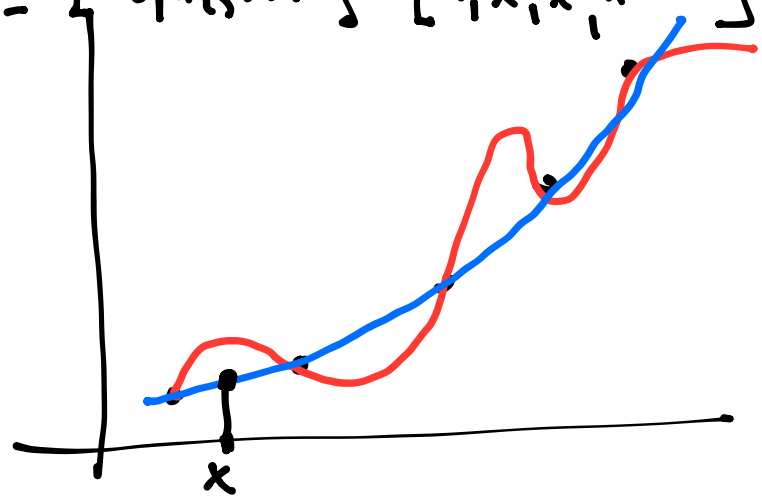
$$m(x) = a_0 + a_1 x + a_2 x^2 + \cdots + a_n x^n \qquad a_i = ?$$

$$= [a_0, a_1, \ldots] \cdot [1, x, x^2, x^3, \ldots]$$



$$y_0 = a_0 + a_1 x_0 + a_2 x_0^2 + a_3 x_0^3 + \cdots + a_{10} x_0^{10}$$

$$y_1 = a_0 + a_1 x_1 + a_2 x_1^2 + \cdots + a_{10} x_1^{10}$$

$$\begin{matrix} & \downarrow 0 & \downarrow 1 & \downarrow 2 & & & \\ \rightarrow 0 \\ \rightarrow 1 \\ \rightarrow i \end{matrix} \begin{bmatrix} 1 & x_0 & x_0^2 & x_0^3 & \cdots & x_0^{10} \\ 1 & x_1 & x_1^2 & x_1^3 & \cdots & x_1^{10} \\ 1 & x_2 & x_2^2 & x_2^3 & \cdots & x_2^{10} \\ \vdots & \vdots & x_i^j & \vdots & & \vdots \end{bmatrix} \begin{bmatrix} a_0 \\ \vdots \\ a_{10} \end{bmatrix} = \begin{bmatrix} y_0 \\ y_1 \\ \vdots \\ y_{10} \end{bmatrix}$$

$$y_j$$

$$m(x) = a_0 \phi_0(x) + a_1 \phi_1(x) + a_2 \phi_2(x) \cdots + a_n \phi_n(x)$$

$$\phi = \{1, x, x^2, x^3 \ldots x^n\}$$

$$\phi = \{1, e^x, e^{2x}, e^{3x} \ldots\}$$

$$\phi = \{ \sin x, \sin 2x, \sin 3x \dots \}$$

$$\phi = \{ 1, x, e^x, \sin 3x \dots \}$$

$$\begin{bmatrix} 1 & e^{x_0} & e^{2x_0} & & \\ 1 & e^{x_1} & e^{2x_1} & & \\ 1 & e^{x_2} & \vdots & & e^{jx_i} \\ 1 & \vdots & & & \end{bmatrix}$$

$$\begin{bmatrix} \phi_1(x_0) & \phi_2(x_0 & \cdots & \\ \phi_1(x_1) & \phi_2(x_1) & \cdots & \\ \phi_1(x_2) & \phi_2(x_2) & \cdots & \end{bmatrix}$$