polynomial regression (curve fit)

→ x ← first

x^2 ← second order

x^3 ← third order

0, 1, 2, 3, 4, 5, 6

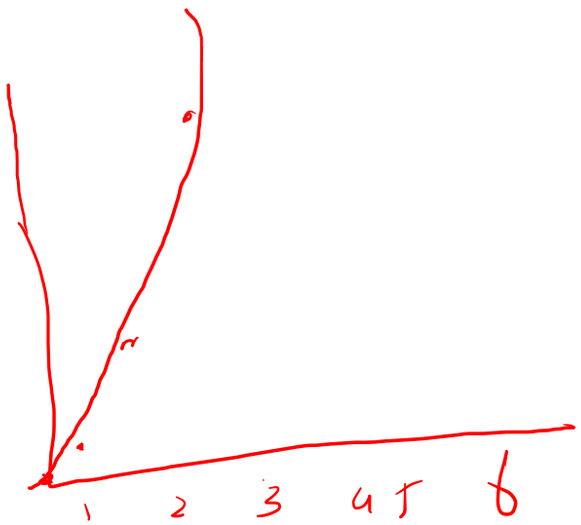
$y = x$

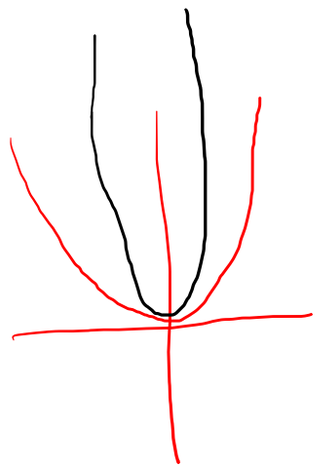
polynomial equation

order

$1 + (x) + x^{(2)} + x^3$

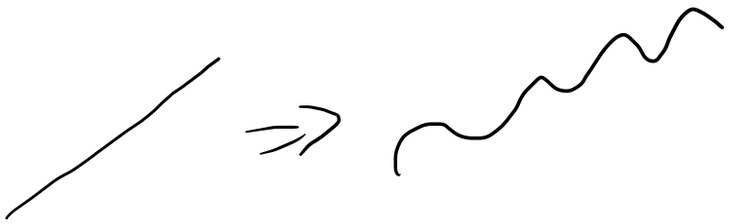
$y = x^2$

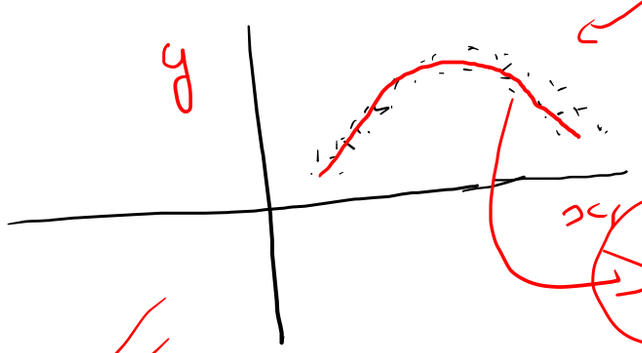




$y = x^3$

$x^3 + x^2 + 4x + 1 = 0$





polynomial equation

order (or) degree

$y = \theta_0 + \theta_1 x_1 + \theta_2 x_1^2 + \theta_3 x_1^3$

curve fitting

curve

line

overfit

regularization

to avoid overfitting

$y = \theta_0 + \theta_1 x$

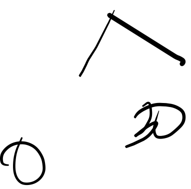
polynomial regression

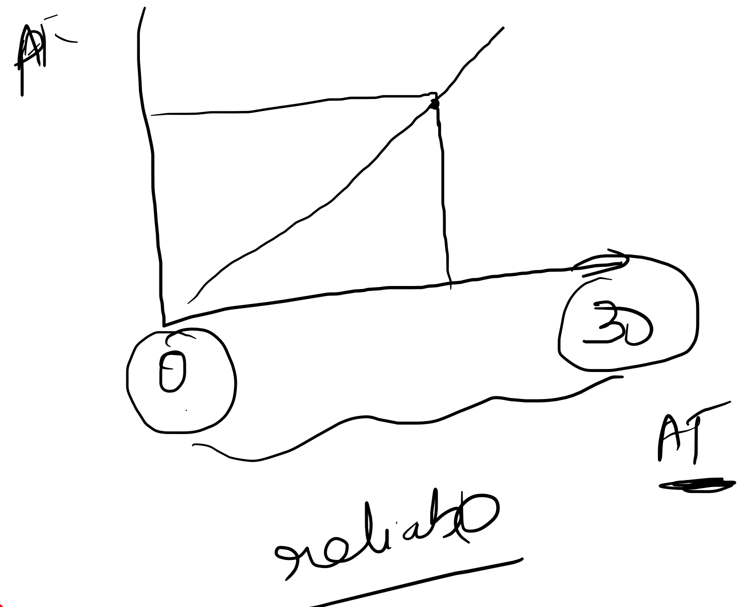
$h_\theta(x) = \theta_0 + \theta_1 x$

$h_\theta(x) = \theta_0 + \theta_1 x_1 + \theta_2 x_1^2 + \theta_3 x_1^3$

Interpolation | extrapolation

AT → PE



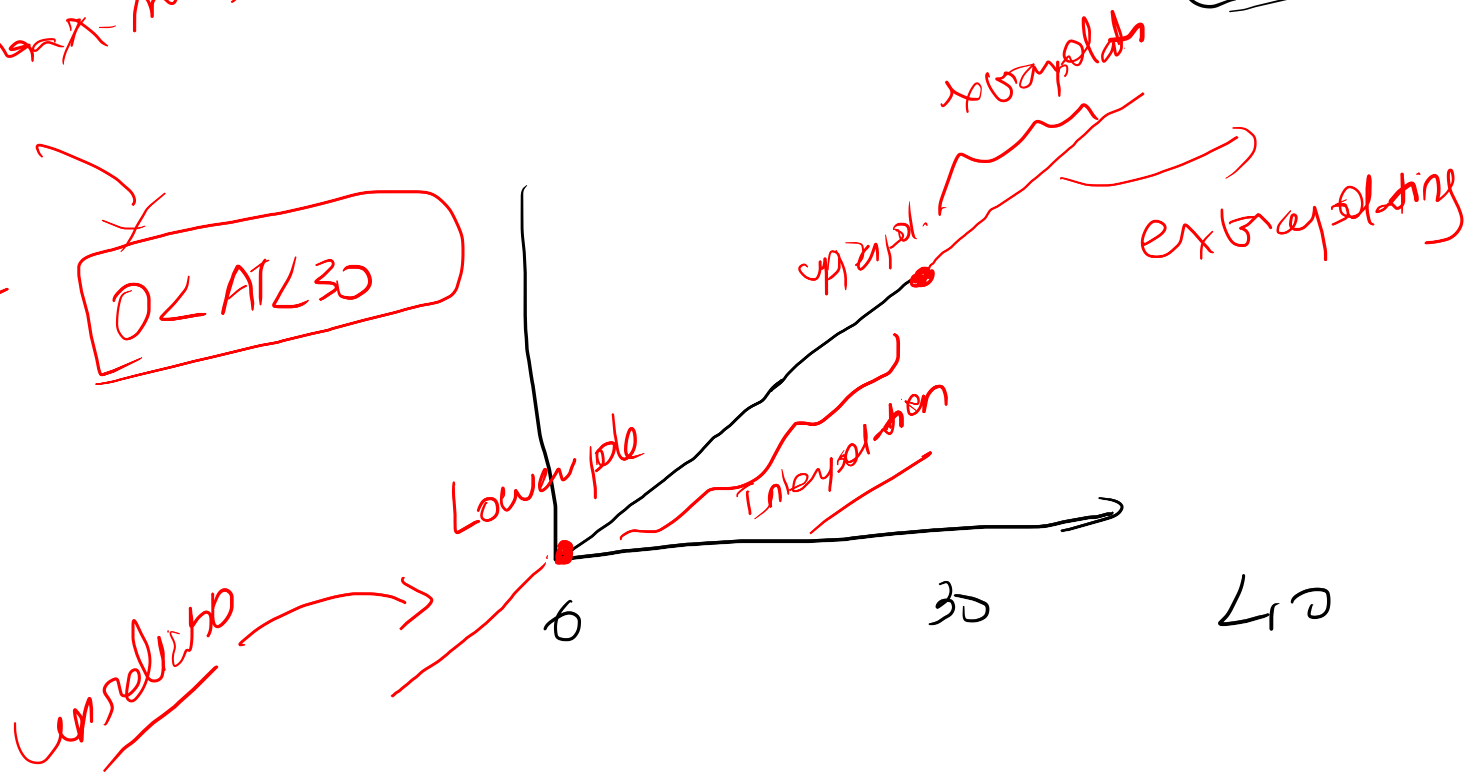


$$y = \begin{cases} f(x) & 0 < x < 30 \\ 0 & \text{—} \end{cases}$$

$$y = \begin{cases} \theta_0 + \theta_1 x & 0 < x < 30 \\ 0 & \end{cases}$$

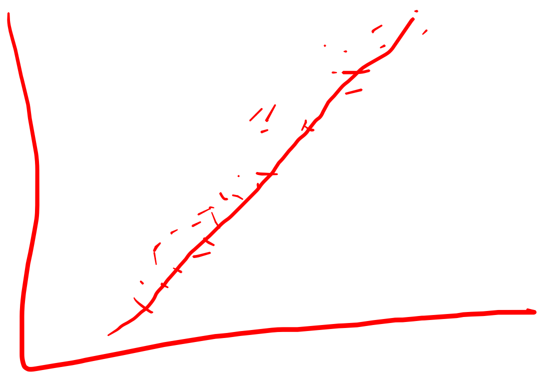
range (max − min)

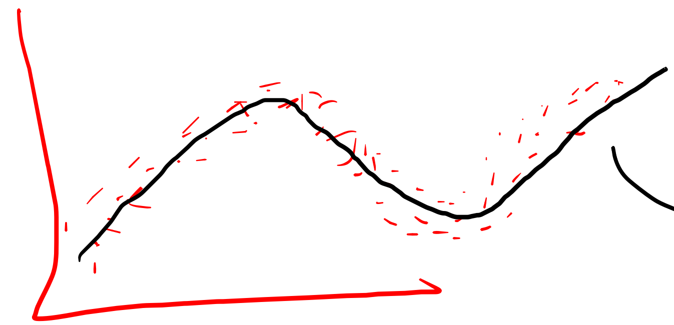
$$y = \begin{cases} \theta_0 + \theta_1 AT & 0 < AT < 30 \\ ? & \end{cases}$$



Min

$0 < x < 40$





polynomial equation

regression + $x + x^2 + x^3 + x^4$

polynomial regression

grid search

degree = 1, 2, 3, 4, 5, ... 9

RMSE ... 10

1	2	3	4
10	3.2	1.2	1.23

RMSE

polynomial degrees =>