

Curve Fitting

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Data

- Stock information are collected from Yahoo Finance
- Ten stocks
- Indicators: Low, High, Close ...
- Use “close” for prediction

Fitting Algorithm

Polynomial curve fitting

Minimize:

$$E(w) = \frac{1}{2} \sum_{n=1}^N (y(x_n, w) - t_n)^2$$

Fitting Algorithm

Bayesian curve fitting

It is based on prior probability, which can avoid over fitting.

$$p(t|x, \mathbf{x}, \mathbf{t}) = \int p(t|x, \mathbf{w})p(\mathbf{w}|\mathbf{x}, \mathbf{t}) d\mathbf{w}.$$

$$\begin{aligned} m(x) &= \beta \phi(x)^T \mathbf{S} \sum_{n=1}^N \phi(x_n) t_n \\ s^2(x) &= \beta^{-1} + \phi(x)^T \mathbf{S} \phi(x). \end{aligned}$$

Parameter

Alpha and beta are fixed.

For M:

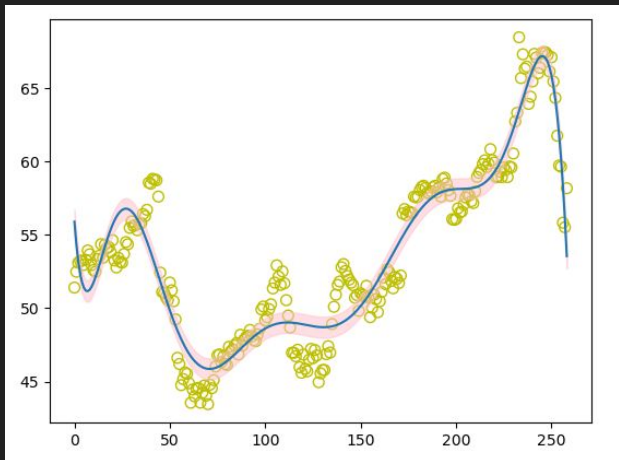
I search M from 1 to 20, and choose the M which has the minimum Residual Sum of Squares(RSS) for N points.

For w:

W is determined by:

$$w = \beta \mathbf{S} \sum_{n=1}^N \phi(x_n) t_n$$

Result



Stock	Absolute Error	Relative Error
NVDA	12.08291	0.05088
AMD	2.192443	0.045352
BABA	7.762001	0.035995
KO	0.611379	0.01068
DIS	5.674601	0.039255
AMZN	56.52476	0.02937
BILI	1.23648	0.055725
NTES	11.22848	0.034946
GOOG	38.99946	0.027195
INTC	2.059722	0.033429

Thank You