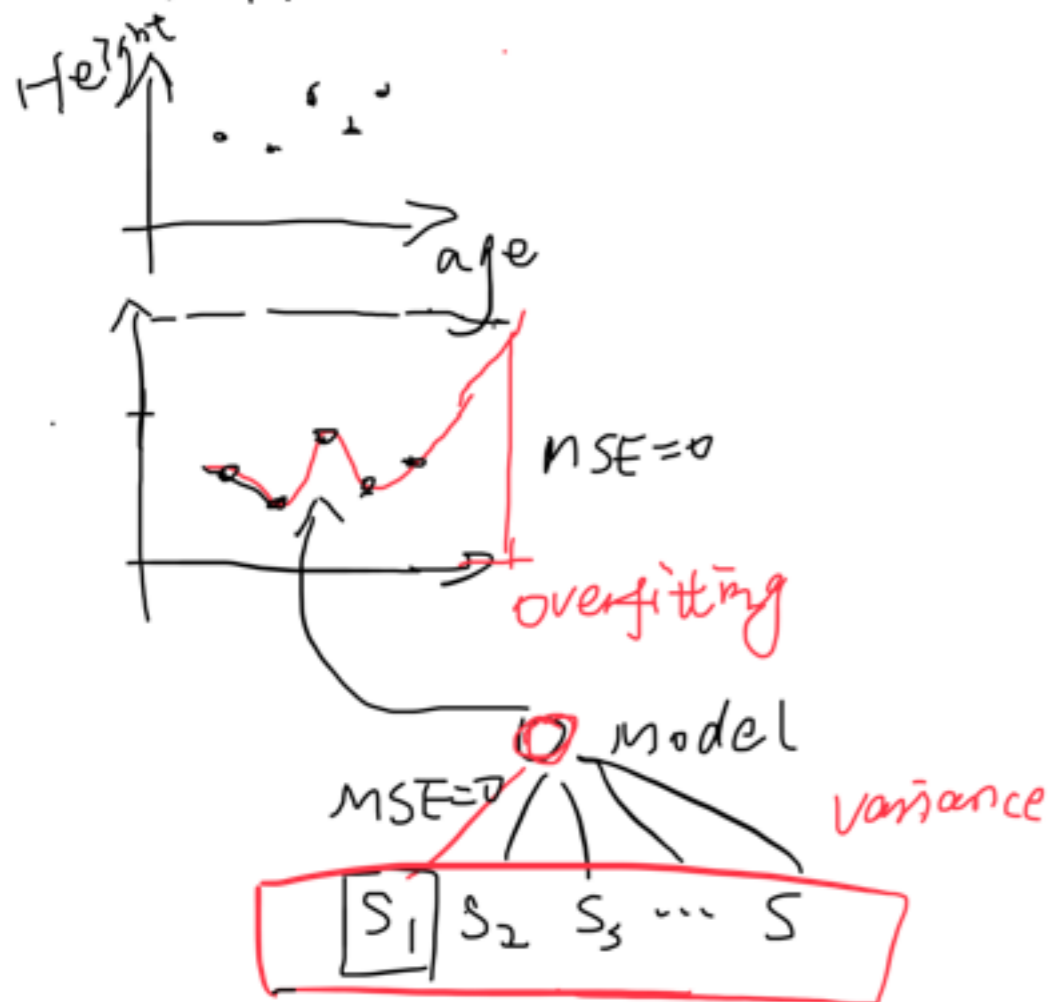


6/1 Mon

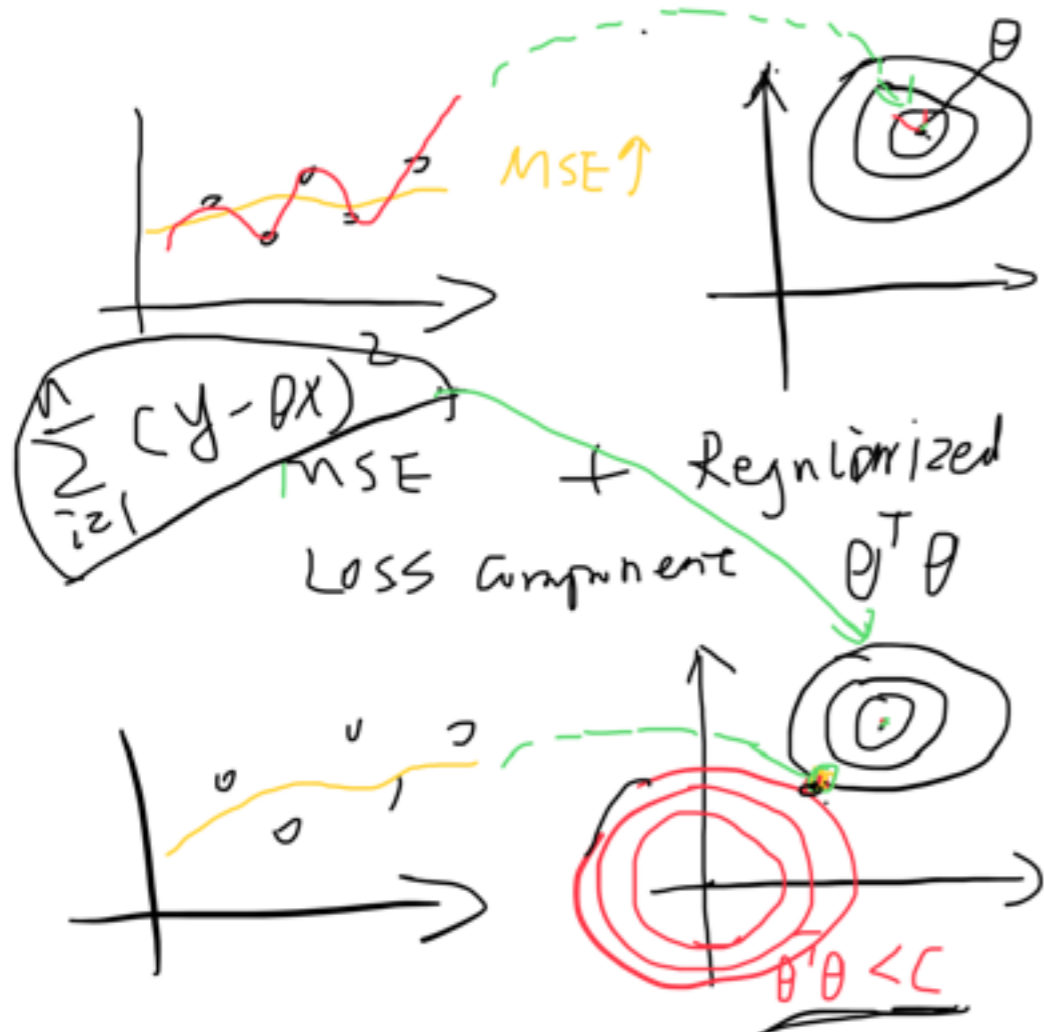
Recap

App

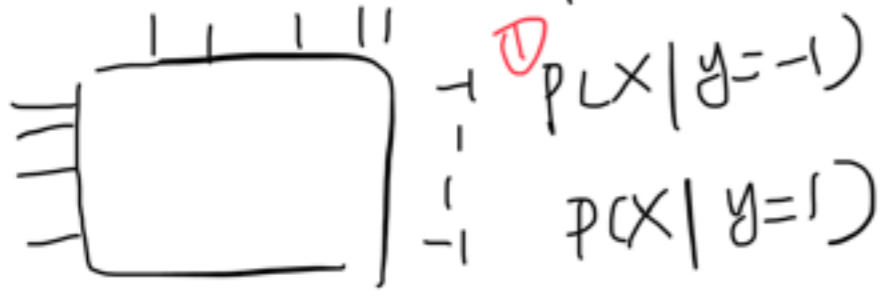
Math



Goal: Bias ↑ variance ↓



$$\textcircled{4} P(y|x) = \frac{P(x|y)P(y)}{P(x)}$$

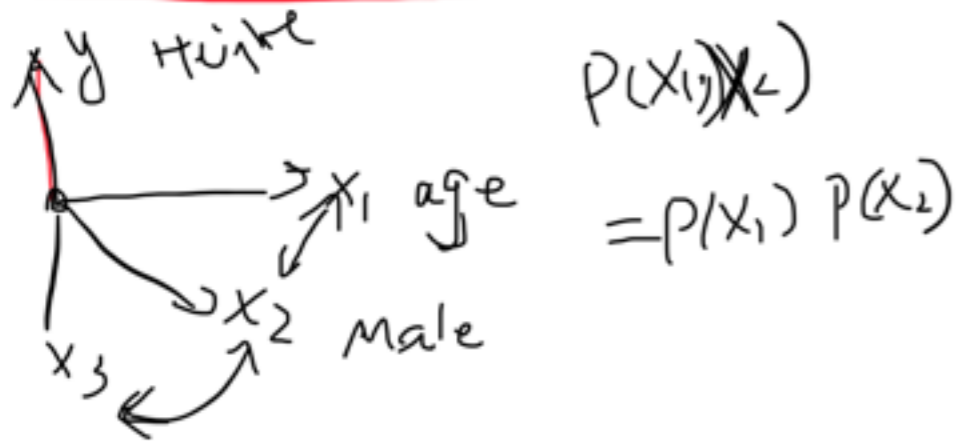


$$\textcircled{2} P(y=-1)P(y=1)$$



$$\textcircled{4} P(y=-1 | x=x') = 0.8$$

$$P(y=1 | x=x') = 0.2$$



$$P(y=1|x) = \frac{P(x|y=1)P(y=1)}{P(x)} = \frac{\sim}{\sum_y P(x|y)}$$

Binary Classification

$$y \begin{cases} -1 \\ +1 \end{cases}$$

$$= \frac{\sim}{P(x, y=1) + P(x, y=-1)}$$

$$P(y=1) = \pi_1$$

$$P(y=-1) = 1 - \pi_1$$

$$S = \frac{(1-\pi_1) \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2\sigma^2}(x_i - \mu)^2}}{\pi_1 \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2\sigma^2}(x_i - \mu)^2}}$$

Normalized

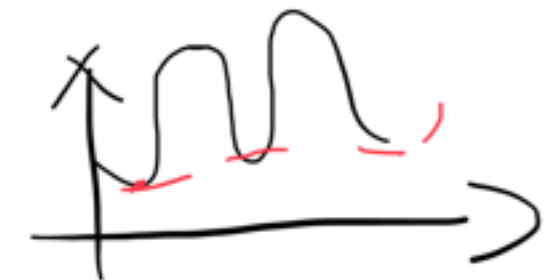
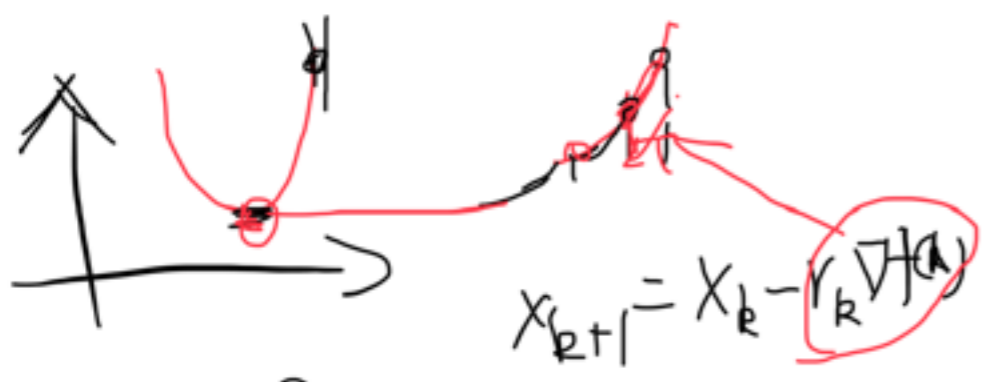
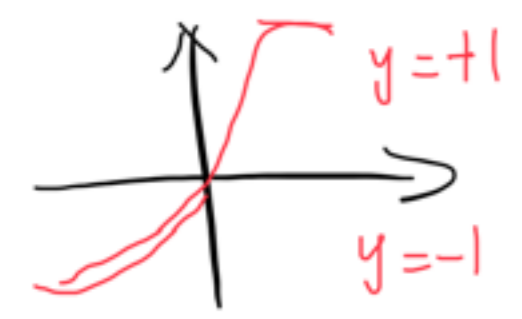
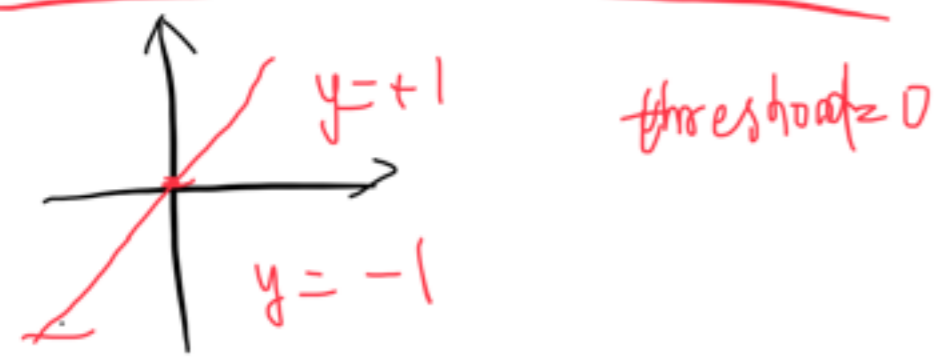
$$= \cancel{\frac{1}{\sqrt{2\pi}\delta}} + -\frac{1}{2\delta^2} (X_i - u_{0i})^2$$

$$- \cancel{\frac{1}{\sqrt{2\pi}\delta}} + 2\frac{1}{\delta^2} (X_i - u_{1i})^2$$

$$= \cancel{\frac{1}{2\delta^2}} X_i^2 + u_{0i}^2 - 2u_{0i}X_i$$

$$- \cancel{\frac{1}{2\delta^2}} X_i^2 + u_{1i}^2 - 2u_{1i}X_i$$

$$= -\frac{2u_{0i} - u_{1i}}{2\delta^2} X_i + \frac{u_{0i}^2 - u_{1i}^2}{2\delta^2}$$



step size small

