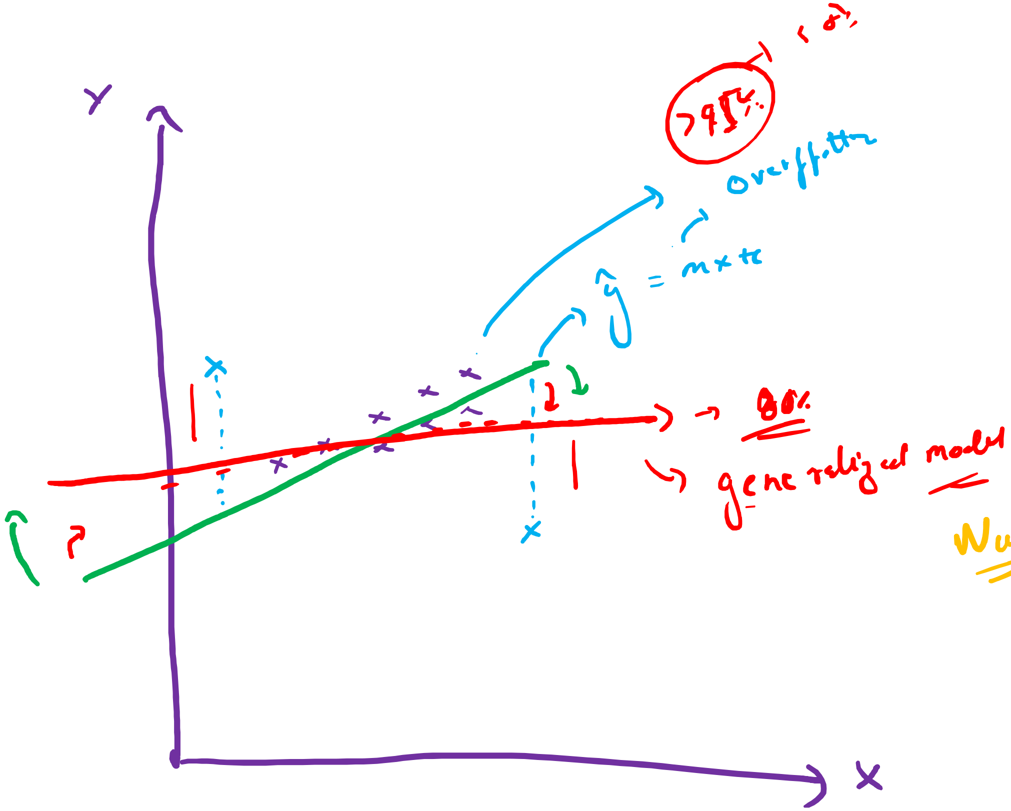
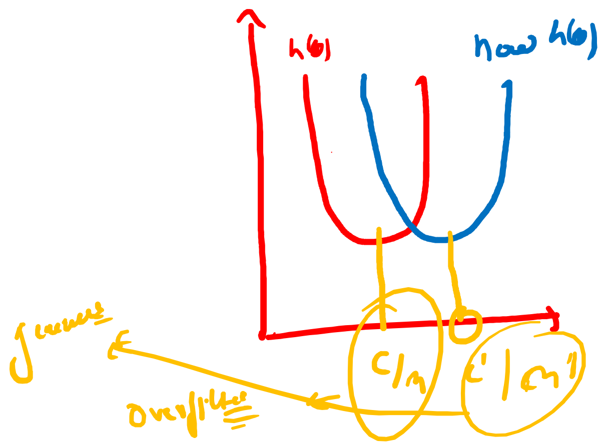
→ Regularization → To counter the problem of overfitting



Regularization
↳ Add a Penalty for overfitting to the cost f^n

Now $h(\theta) = \underline{MSE} + \underline{Penalty}$



→ L_1 Regularization (Lasso Regression)

$$\hat{y} = m_1 x_1 + m_2 x_2 + \cdots + m_n x_n + c$$

Penalty ⇒ $\lambda \sum |\text{Slope}| = \lambda \sum_{i=1}^{n} |m_i| \Rightarrow \lambda \left(|m_1| + |m_2| + |m_3| + \cdots + |m_n| \right)$

Learning rate

Same as α

$\alpha = 0.01$

$\lambda = 0.01$ · 0.1 · 100

= 0.001

⇒ L_1 Reg. ⇒ $h(\theta) = MSE + \lambda \sum |m_i|$

L_1 = 78%

L_2 81

78%

80%

Learning

Cancer on Public ⇒ 99%

① Create a normal L.R. Model

If. R_2 & Adj $R^2 \geq 0.95$

0.95 ✗

then

→ Create L_1 → LassoRegression()

Calc R^2 & Adj R^2

→ Create L_2 → RidgeRegression()

Calc R^2, Adj R^2

Compare (L_1 & L_2)

↳ choose that Regularization

→ L2 Regularization (Ridge Regression)

Penalty ⇒ $\lambda \sum m_i^2 \Rightarrow \lambda \left(m_1^2 + m_2^2 + m_3^2 + \cdots + m_n^2 \right)$

$$h(\theta) = MSE + \lambda \sum m_i^2$$

Strictly well Known

Convex