

Makine Öğrenmesi

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Regülerizasyon : Bölüm 1

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REGÜLARİZASYON

BÖLÜM 1

- Vektör Büyüklükleri
- R^2 Skoru
- Çapraz Doğrulama



$$\vec{w} = \begin{bmatrix} w_0 \\ w_1 \end{bmatrix}$$

$$L2 - \text{Büyüklüğü} : \|\vec{w}\|_2 = \sqrt{w_0^2 + w_1^2}$$

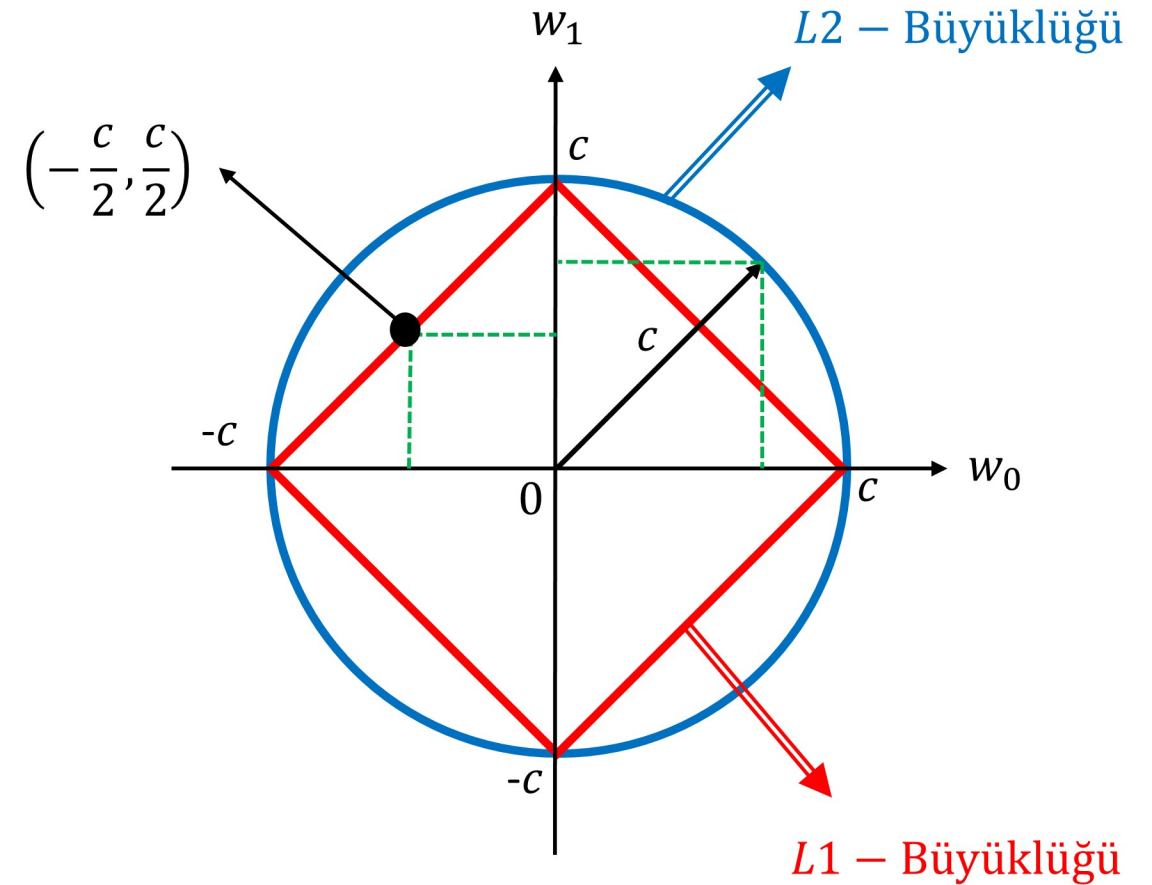
$$L1 - \text{Büyüklüğü} : \|\vec{w}\|_1 = |w_0| + |w_1|$$

$$\vec{w} = \begin{bmatrix} w_0 \\ w_1 \\ \vdots \\ w_n \end{bmatrix}$$

$$\|\vec{w}\|_1 = |w_0| + |w_1| + \dots + |w_n|$$

$$\|\vec{w}\|_2 = \sqrt{w_0^2 + w_1^2 + \dots + w_n^2}$$

$$\|\vec{w}\|_1 = c \quad \|\vec{w}\|_2 = c$$

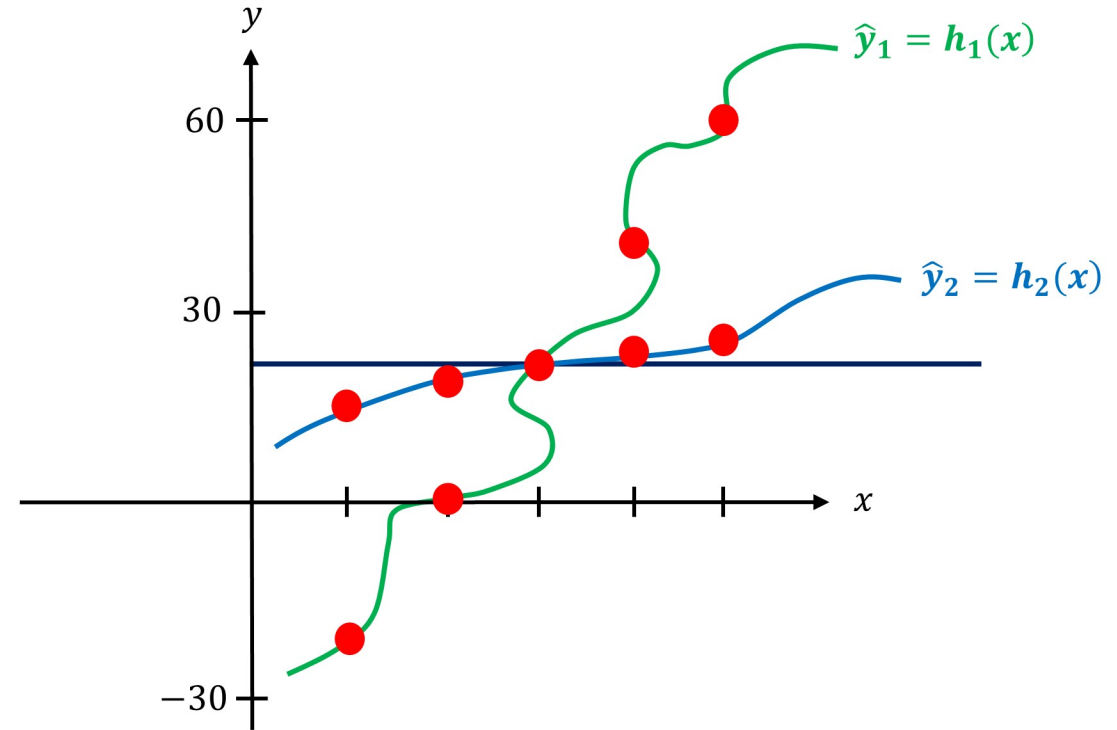


Varyans (Variance)

$$\hat{y}_1 = \begin{bmatrix} \hat{y}^{(0)} \\ \hat{y}^{(1)} \\ \vdots \\ \hat{y}^{(m)} \end{bmatrix} = \begin{bmatrix} -20 \\ 0 \\ 20 \\ 40 \\ 60 \end{bmatrix} \quad \hat{y}_2 = \begin{bmatrix} \hat{y}^{(0)} \\ \hat{y}^{(1)} \\ \vdots \\ \hat{y}^{(m)} \end{bmatrix} = \begin{bmatrix} 16 \\ 18 \\ 20 \\ 22 \\ 24 \end{bmatrix}$$

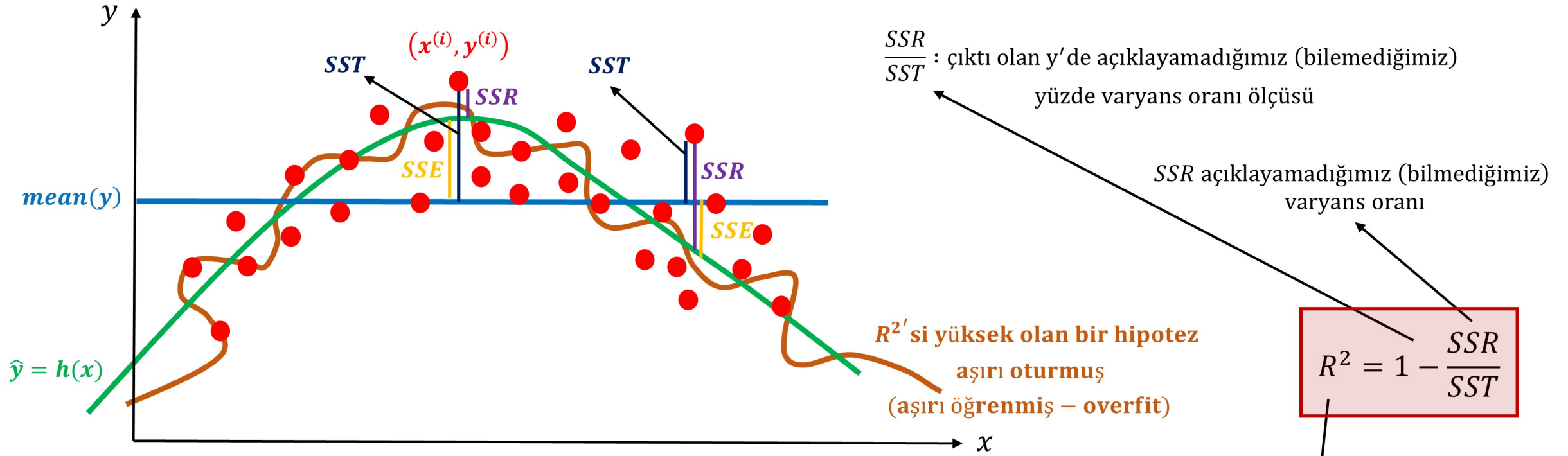
$$\text{varyans} = \sigma^2 = \frac{1}{m} \sum_{i=0}^m \left(\hat{y}^{(i)} - \text{mean}(\hat{y}) \right)^2$$

$$\text{standart sapma (standard deviation)} = \sqrt{\sigma^2}$$



$$\text{var}(\hat{y}_1) = \frac{(-20 - 20)^2 + (0 - 20)^2 + (20 - 20)^2 + (40 - 20)^2 + (60 - 20)^2}{5} = \frac{4000}{5} = 800 \longrightarrow \text{yüksek varyans}$$

$$\text{var}(\hat{y}_2) = \frac{(16 - 20)^2 + (18 - 20)^2 + (20 - 20)^2 + (22 - 20)^2 + (24 - 20)^2}{5} = \frac{40}{5} = 8 \longrightarrow \text{düşük varyans}$$

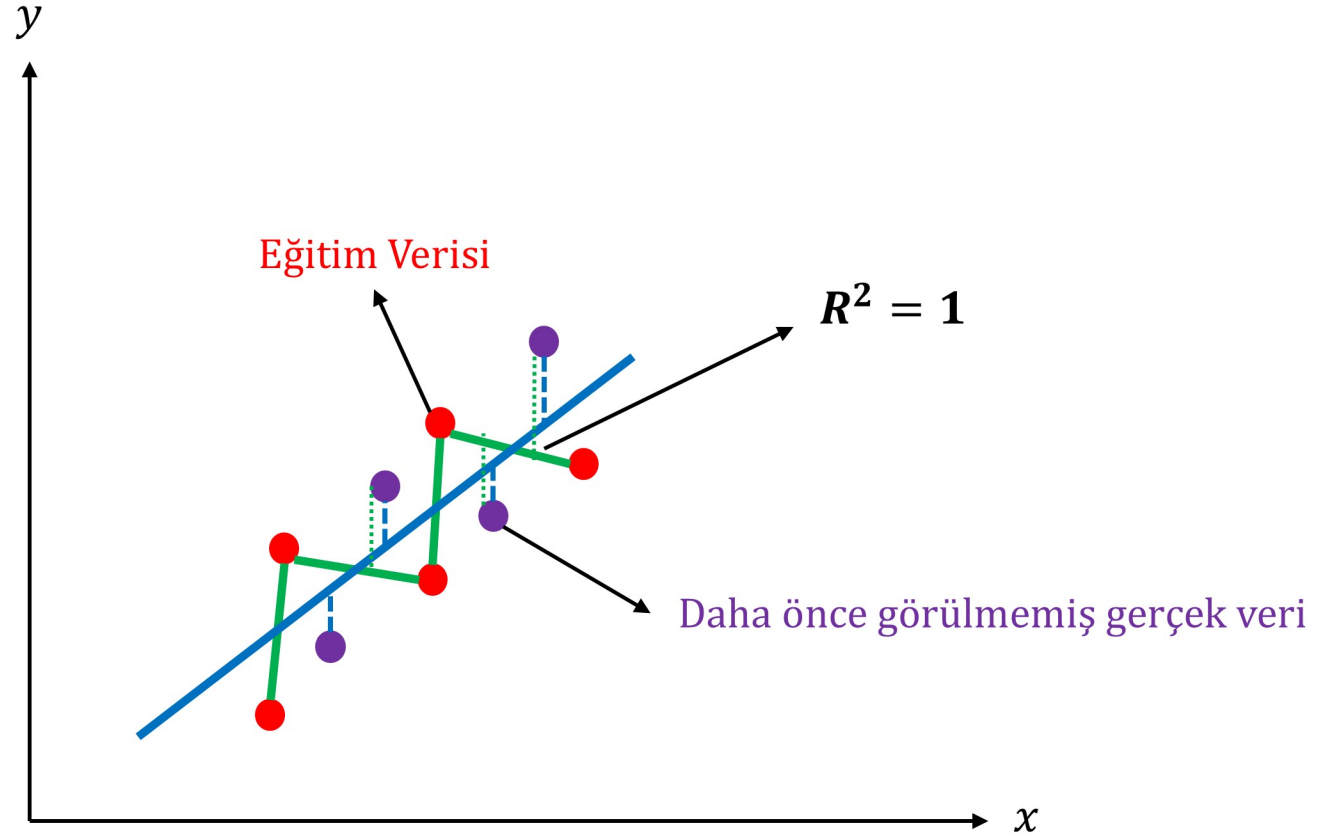


$$\text{Sum of Squares Total : } SST = \sum_{i=0}^m (y^{(i)} - mean(y))^2$$

$$\text{Sum of Squares Residual : } SSR = \sum_{i=0}^m (y^{(i)} - \hat{y}^{(i)})^2$$

$$\text{Sum of Squares Explained : } SSE = \sum_{i=0}^m (\hat{y}^{(i)} - mean(y))^2$$

R^2 yüksek olması (1'e yakın), SSR 'ın çok düşük olduğu anlamına gelir.



Train Test Split

Test Verisi
Eğitim Verisi
Eğitim Verisi
Eğitim Verisi
Eğitim Verisi

Çapraz Doğrulama Yöntemi (Cross Validation)

