

•  $R^2$

$r^2$

$$R^2 = 1 - \frac{SS_{res}}{SS_{tot}}$$

SS: sum of square  
res: residual  
tot: total

•  $R^2$ : how much of the variance in  $y$  explained by the model  $\hat{y}$

•  $R^2$ : squared of correlation b/w the true & predicted outcomes.

$$SS_{res} = \sum (y_i - \hat{y}_i)^2 \quad (\text{Predictive error})$$

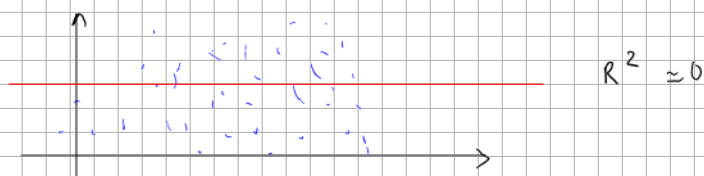
$$SS_{tot} = \sum (y_i - \bar{y})^2 \quad (\text{Variance})$$

Ex: •  $SS_{res} \approx 0$

→  $R^2 \approx 1$  → Perfect model

•  $SS_{res} \approx SS_{tot}$

→  $R^2 \approx 0$  → Bad model



•  $SS_{res} > SS_{tot}$

→  $R^2 < 0$  → Mean is better than any predicted model