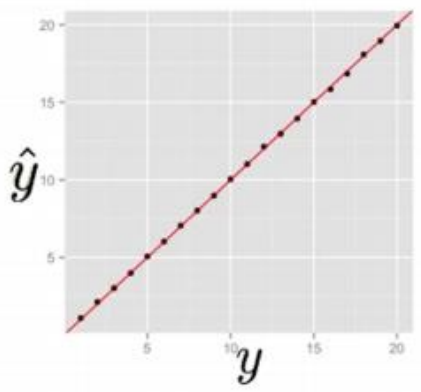
Mean Squared Errors

Mean Absolute Error (MAE)

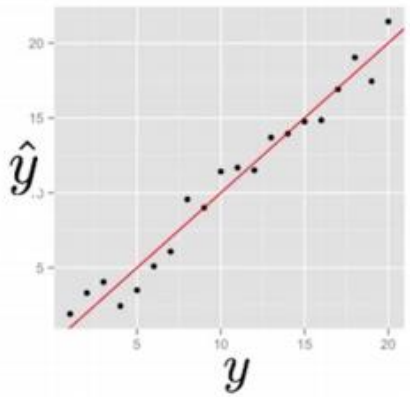
$$MAE = \frac{1}{n}\sum_i |y_i - \hat{y}_i|$$

Mean Squared Error (MSE)

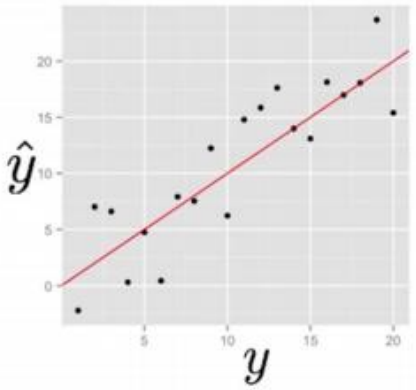
$$MSE = \frac{1}{n}\sum_i (y_i - \hat{y}_i)^2$$



MAE = 0.0837
MSE = 0.0129

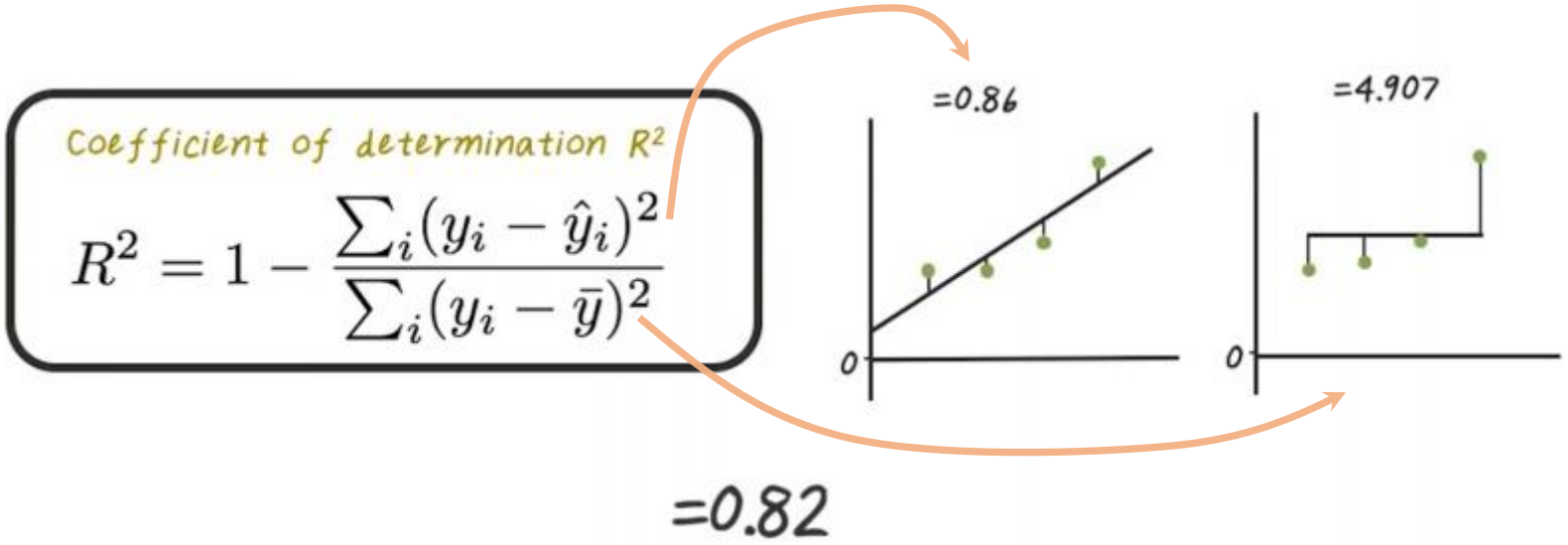


MAE = 0.7804
MSE = 1.1883

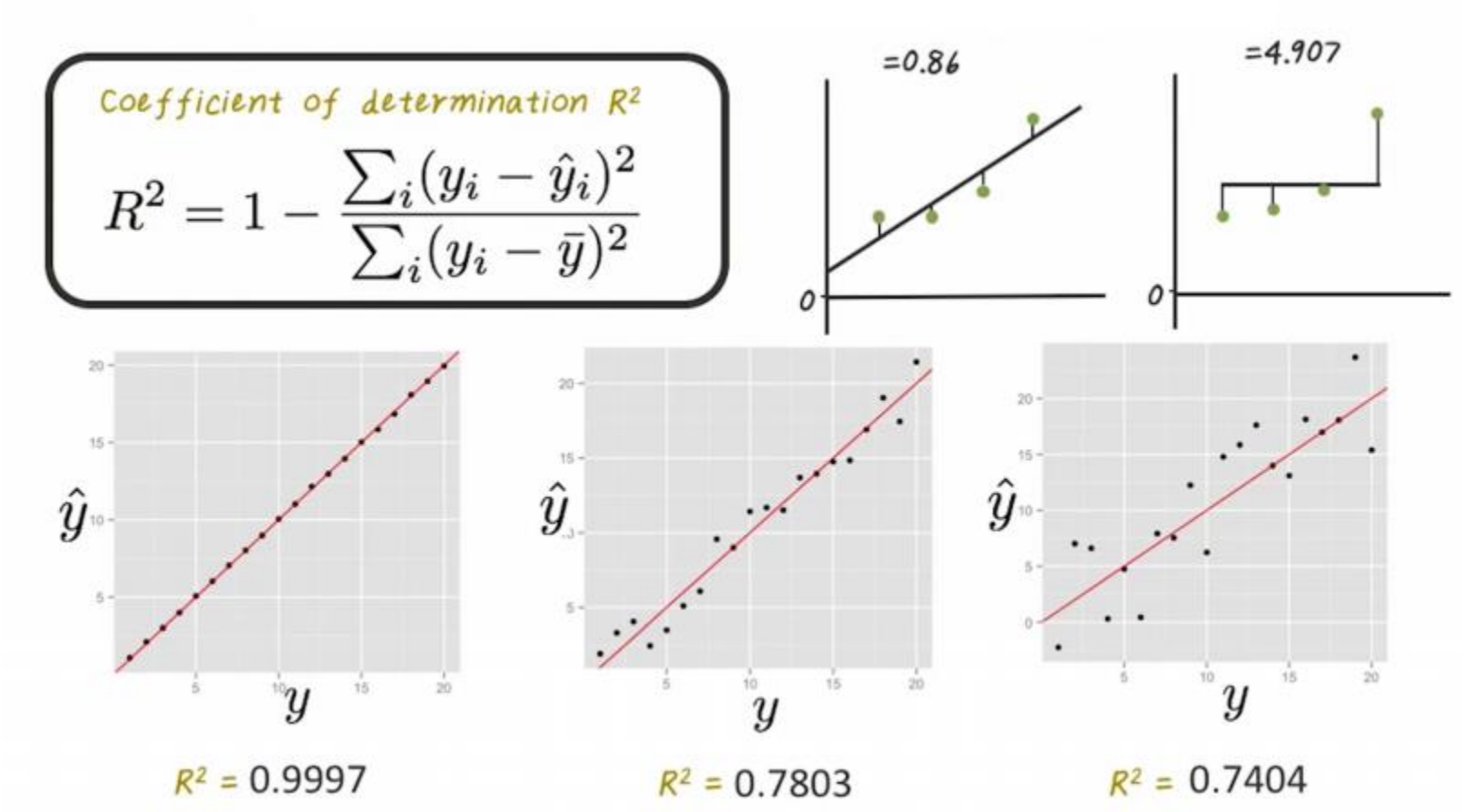


MAE = 3.4328
MSE = 18.6435

Coefficient of Determination (Regression Metrics)

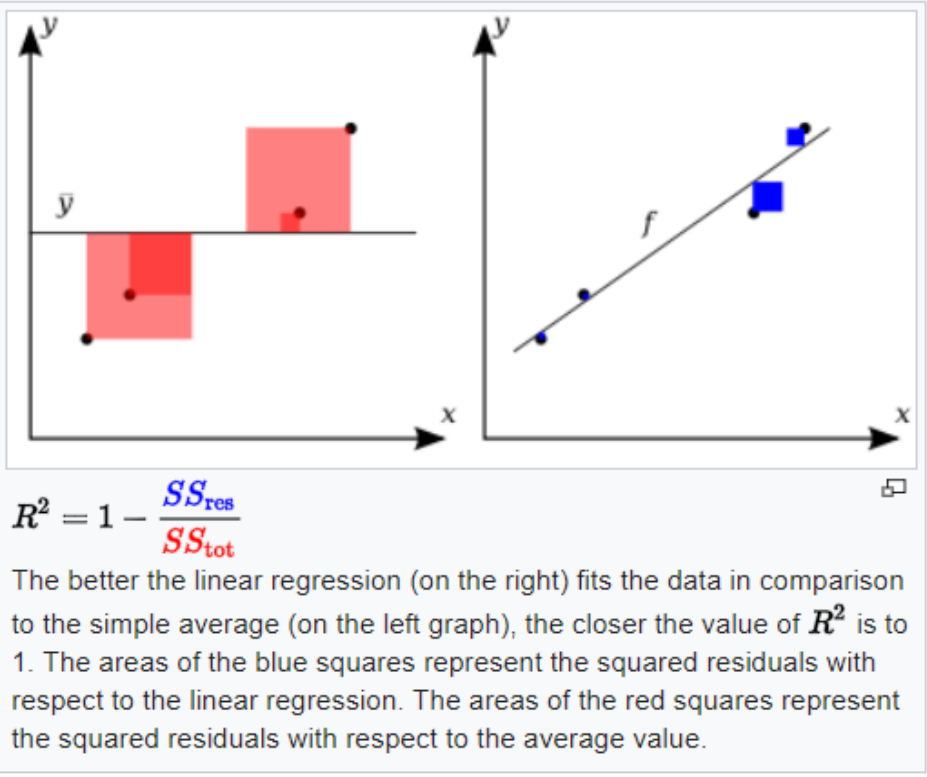


Different **R-Squared** variations



Linear Regression

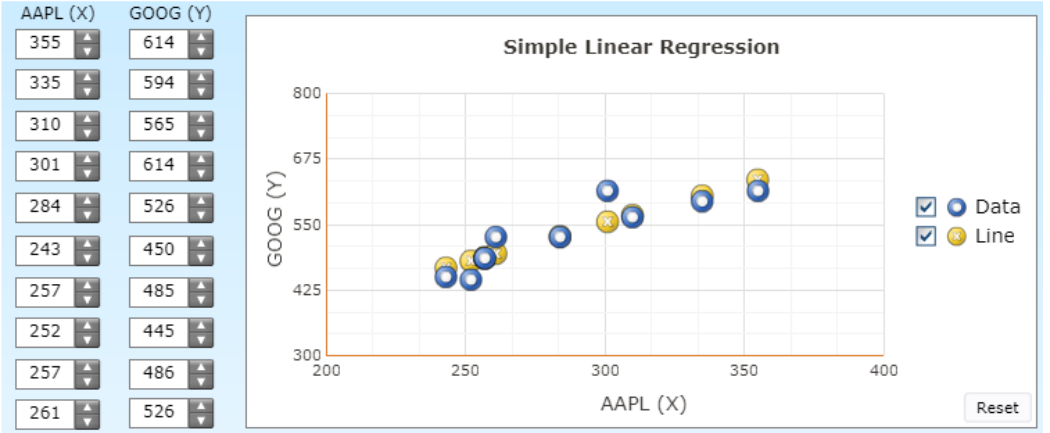
Coefficient of Determination (R-Squared)



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

The better the linear regression (on the right) fits the data in comparison to the simple average (on the left graph), the closer the value of R^2 is to 1. The areas of the blue squares represent the squared residuals with respect to the linear regression. The areas of the red squares represent the squared residuals with respect to the average value.

Simulation:



	AAPL (X)	GOOG (Y)	(X-avgX)^2	(Y-avgY)^2	(X-avgX)(Y-avgY)	Y'=b0+b1X
	355	614	4830.25	6972.25	5803.25	635.48
	335	594	2450.25	4032.25	3143.25	605.27
	310	565	600.25	1190.25	845.25	567.51
	301	614	240.25	6972.25	1294.25	553.91
	284	526	2.25	20.25	6.75	528.23
	243	450	1806.25	6480.25	3421.25	466.31
	257	485	812.25	2070.25	1296.75	487.45
	252	445	1122.25	7310.25	2864.25	479.90
	257	486	812.25	1980.25	1268.25	487.45
	261	526	600.25	20.25	110.25	493.49
Average	**285.5**	**530.5**				
Variance	**1327.65**	**3704.85**	**SSE**	**6758.67**	**MSE**	**844.83**
Covariance	**2005.35**		**SSR**	**30289.83**	**MSR**	**30289.83**
Slope (b1)	**1.5105**		**SST**	**37048.50**	**F**	**35.85**
Intercept (b0)	**99.2663**		**R2**	**0.8176**		
SE	**29.0660**		**R (LinCorr)**	**0.90**		

http://www.saedsayad.com/flash/SLR.html

Logistic Regression

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