



LINEAR REGRESSION



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LinearRegression

Lets remember equation from high school

$$y = mx + b$$



LinearRegression

	year	per capita income (US\$)
0	1970	3399.299037
1	1971	3768.297935
2	1972	4251.175484
3	1973	4804.463248
4	1974	5576.514583

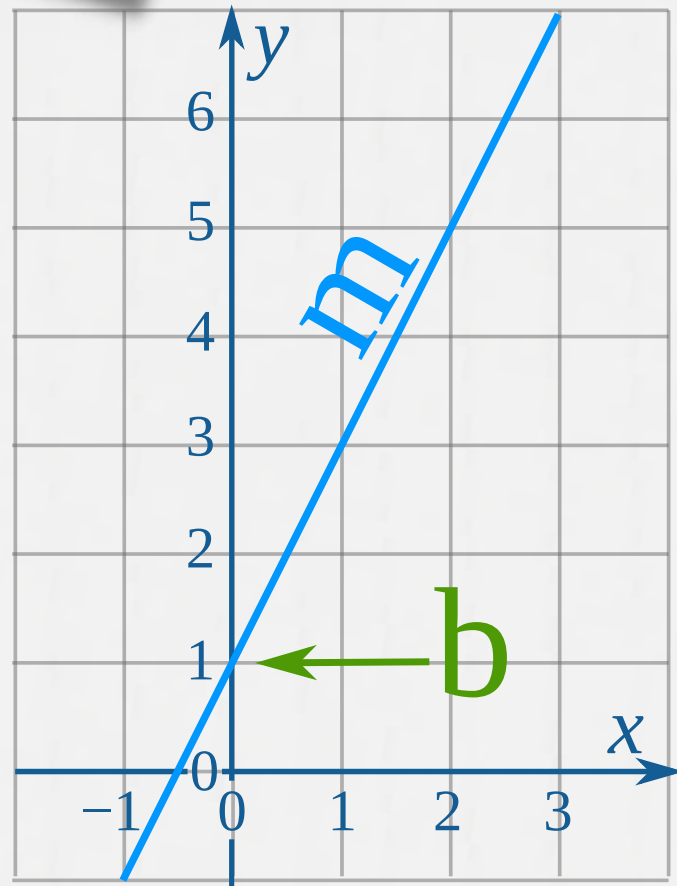
Find?

slope or coef_

intercept_



LinearRegression



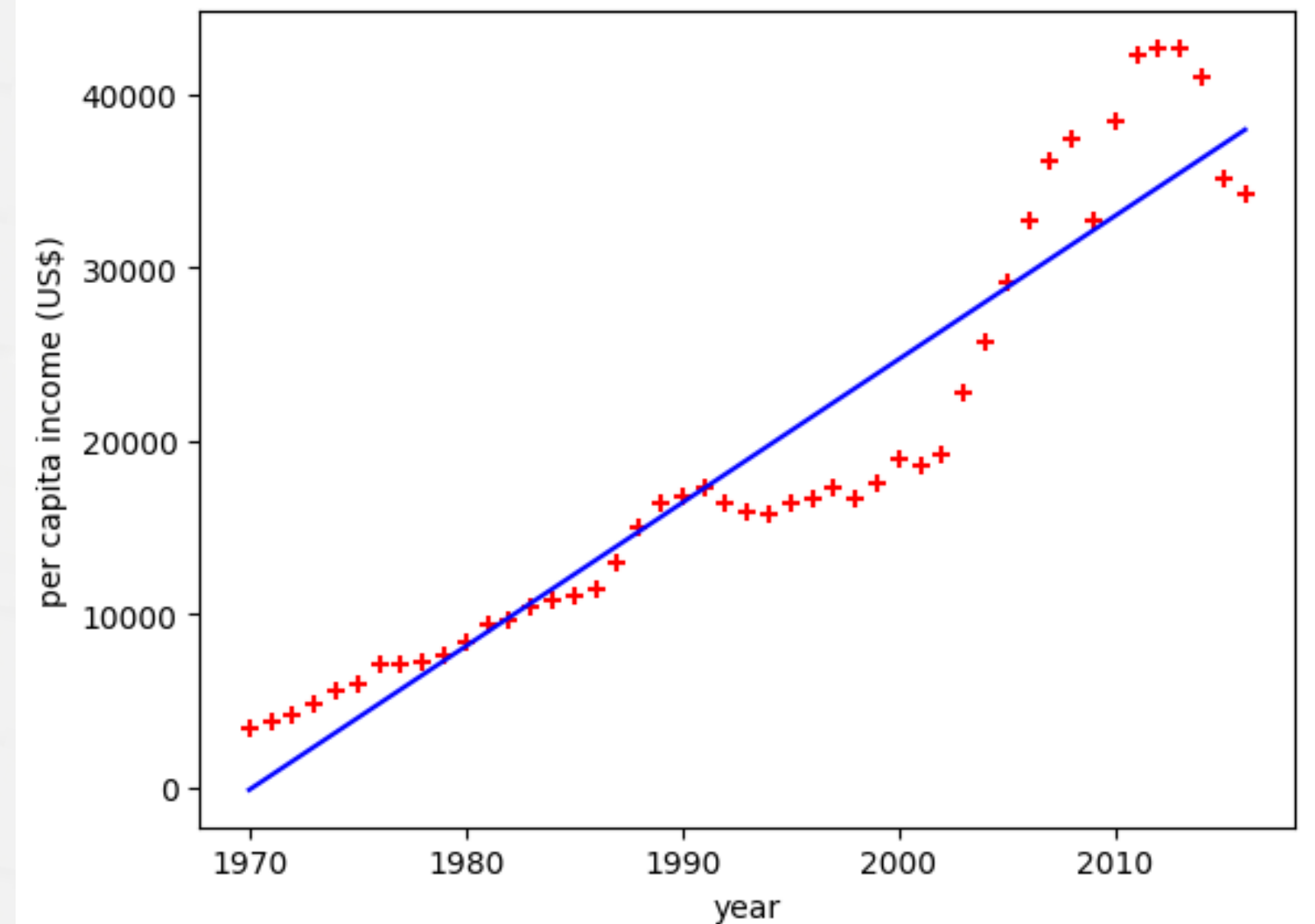
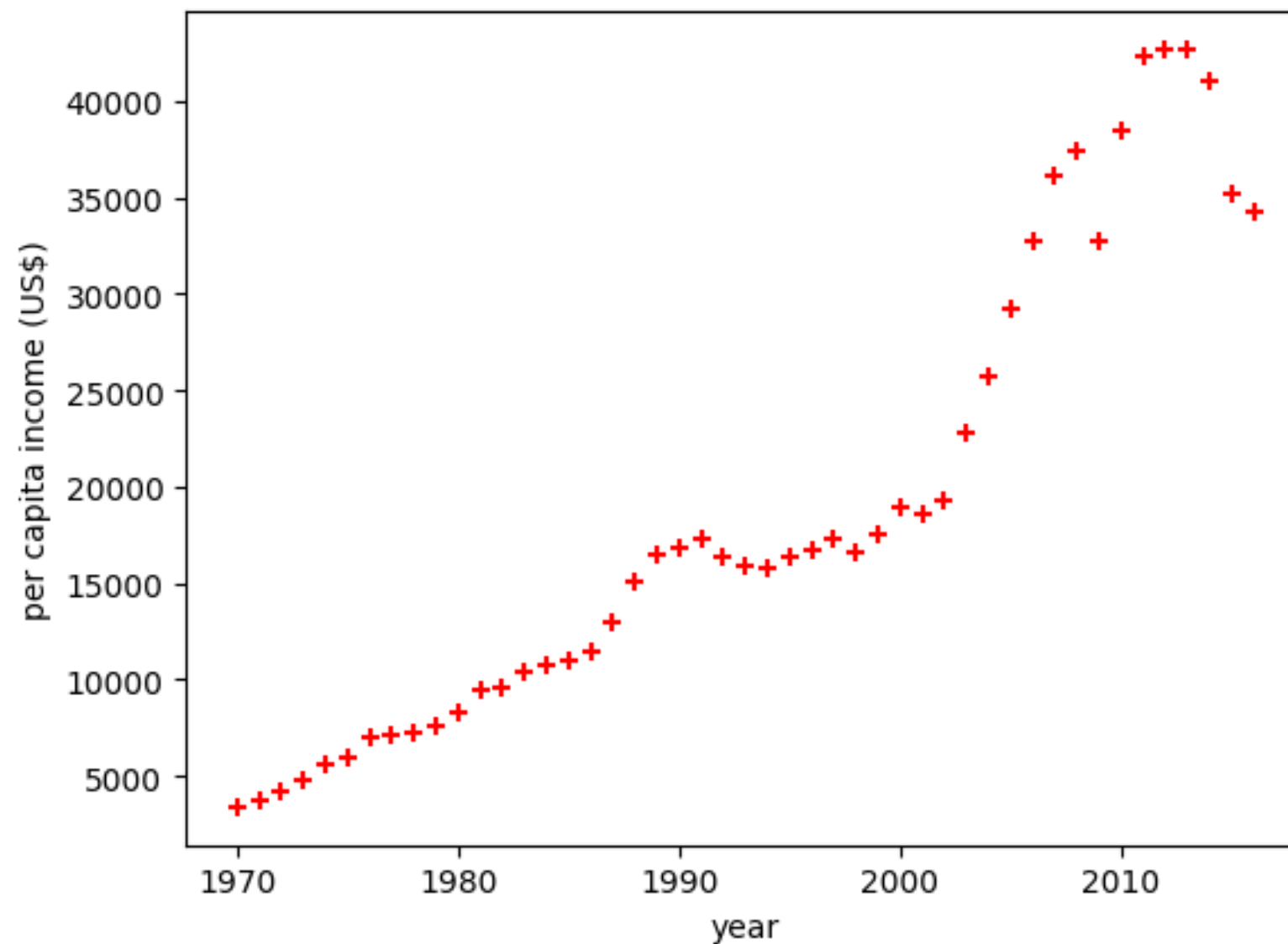
$$\text{income} = m * \text{year} + b$$

$$y = mx + b$$

slope or coef_

intercept_

LinearRegression





Linear Regression

In simple words Linear Regression produce a ml model which gives us **best fit line** on given data point.

- least amount of **least square error (MSE)** or best **R^2 score**.

- Residual = Observed - Predicted
- SSR = Sum of Squared Residual
- $SSR = \sum_{i=1}^n (\text{observed} - \text{predicted})^2$
- Mean Squared Error (MSE) = SSR/n
- $R^2 = [SSR(\text{mean}) - SSR(\text{fitted line})] / SSR(\text{mean})$

Linear Regression

Linear Regression
with one variable

MSE = Least Square error

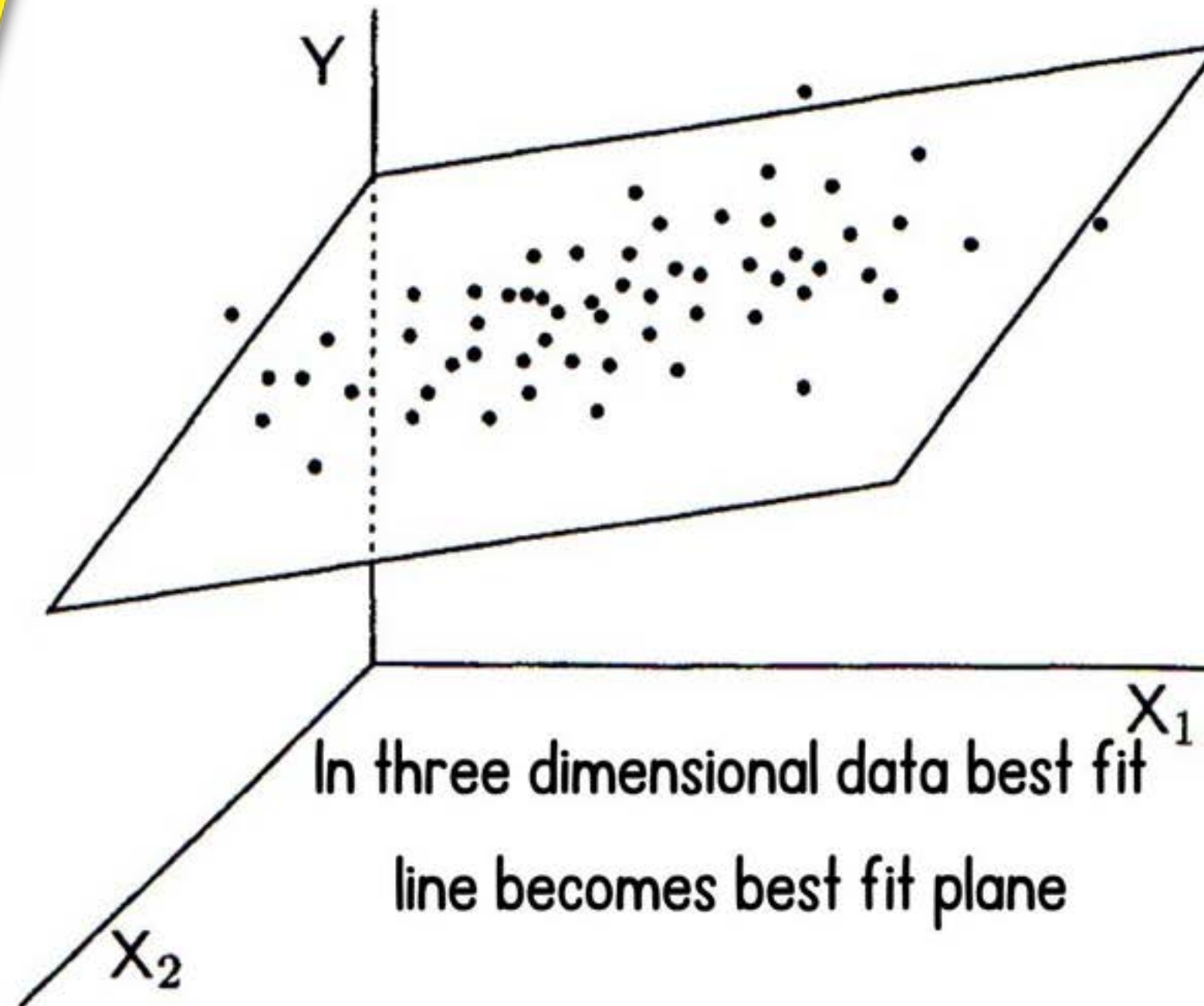
R^2 score or MSE(Mean
Squared Error) is
metric used in both
type of Linear
Regression

$$R^2 = \frac{\text{Var}[\text{mean}] - \text{Var}[\text{line}]}{\text{Var}[\text{mean}]}$$

Yes! there is extension
of Linear Regression
called multi variable
Linear Regression

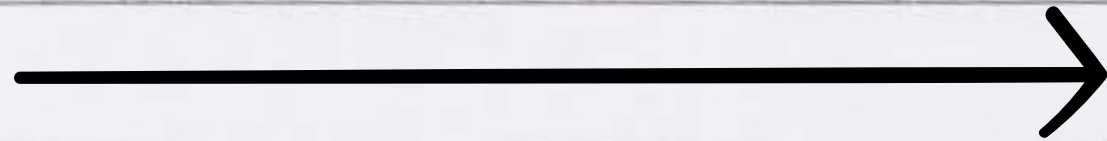
-Let's Talk

R^2 Explains the variation
of actual value's from
predicted value



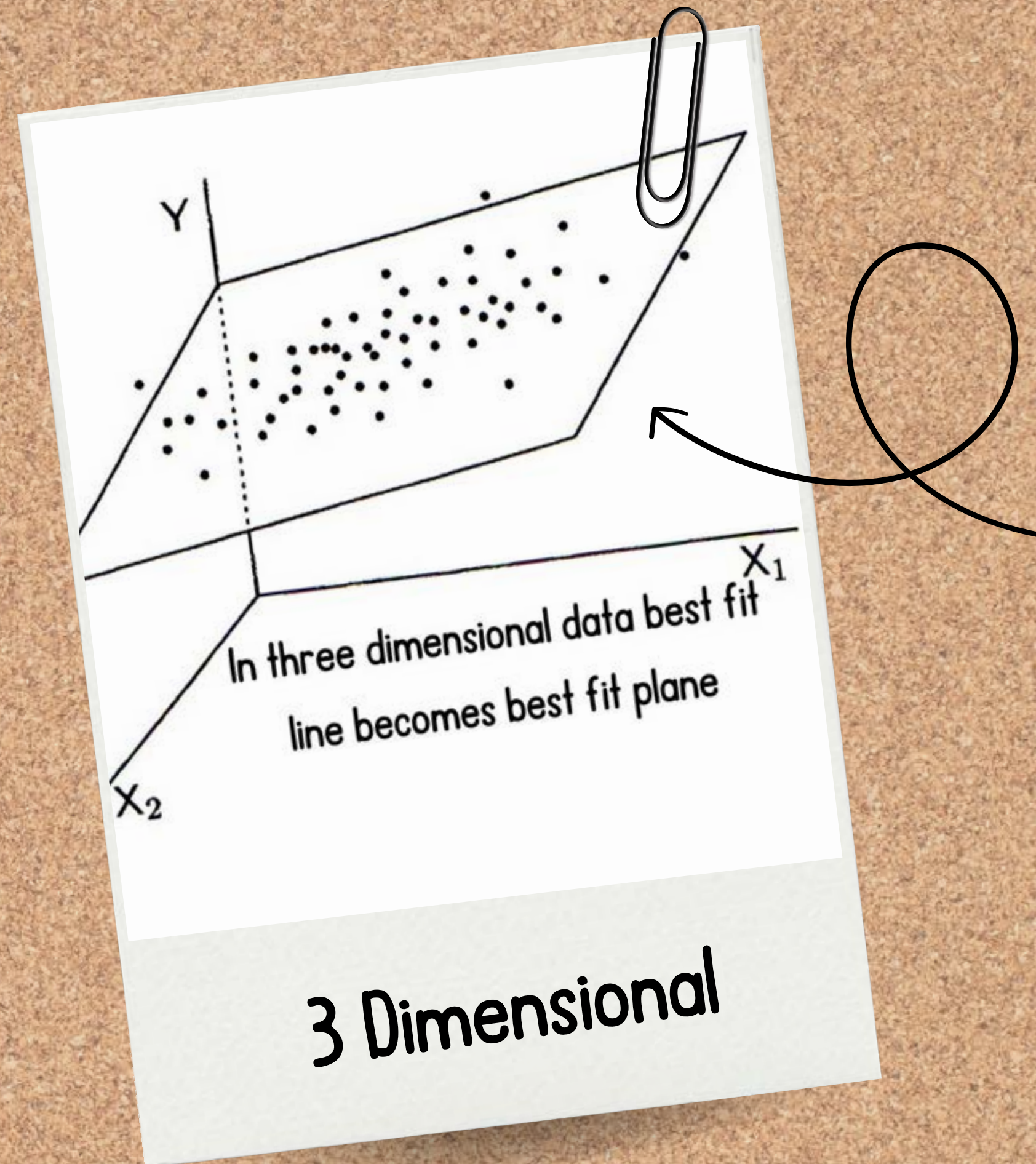
In three dimensional data best fit
line becomes best fit plane

Linear Regression



Greater the dimension more complex
the graph for best fit (line or plane or
some tensor) gets

tensor??



Thanks!

