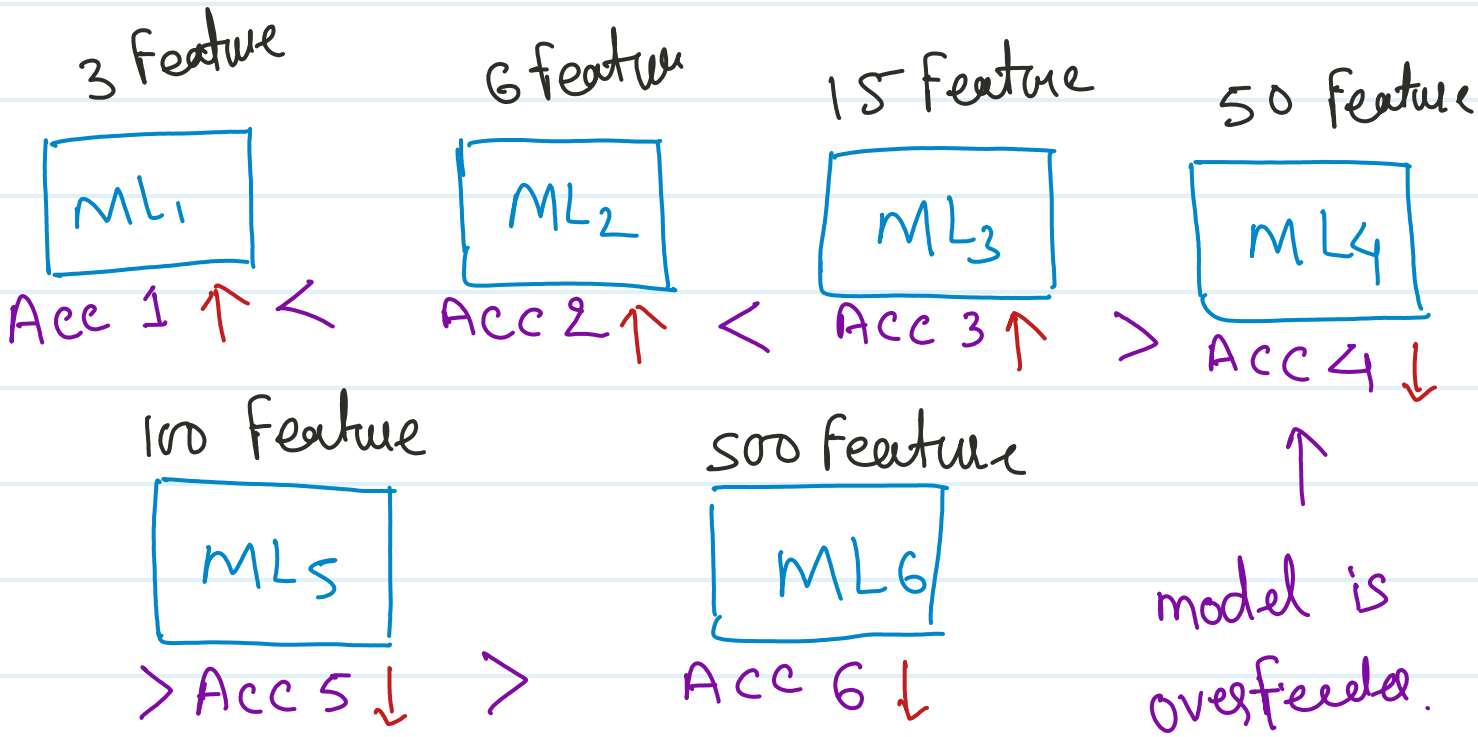
PCA Principal Component Analysis
OR
Dimensionality Reduction

① curse of dimensionality

⇒ Dataset - 500 features



② model performance —
It will degrade

price of house — ↑ No. of Bedroom
↑ No of washroom
↑ Area of flat
↑ Floor of house
↓↑ school near
↓ grossery shope near
↓ who is neabours
↓ what is the wall color
↓ Is any fruit shop near.
↓ Distance from City Center.

Two diff. way of remove curse of dimensionality

① Feature selection
scaling
ⓐ standarization
ⓑ normalization

② Dimensionality Reduction (PCA)
↓
Feature Extraction
Algorithms

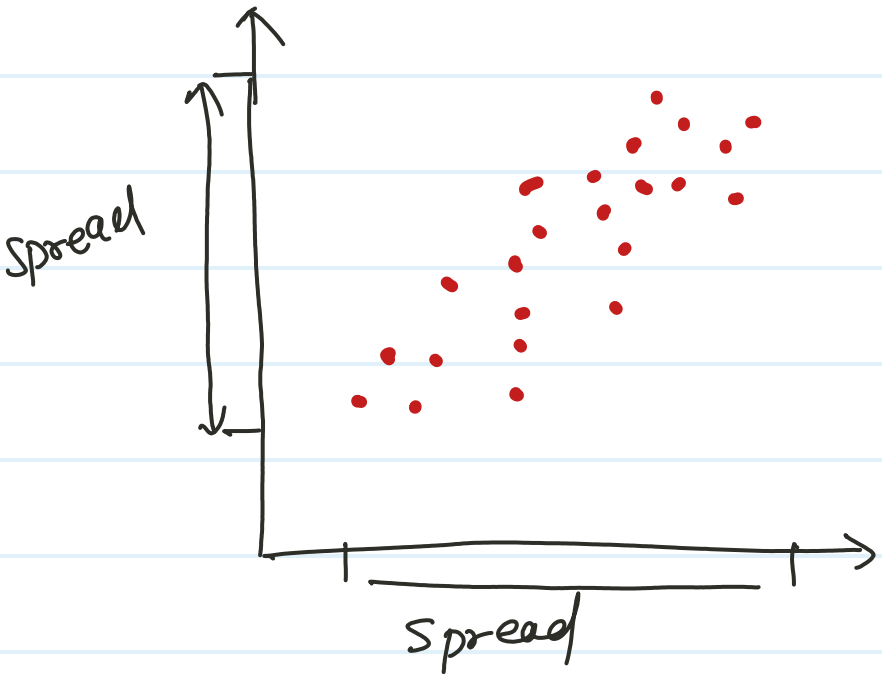
Benefits of PCA

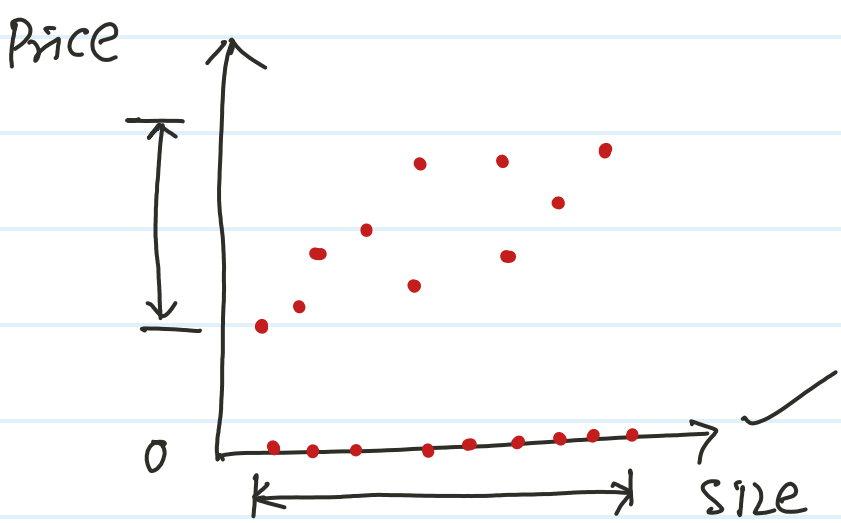
① prevent - curse of dimensionality

② Improve the performance of model

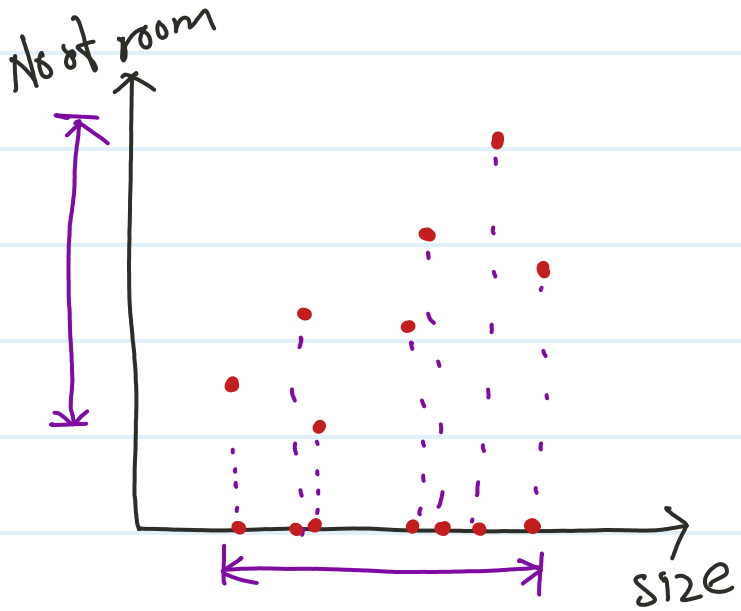
③ Visualization the data

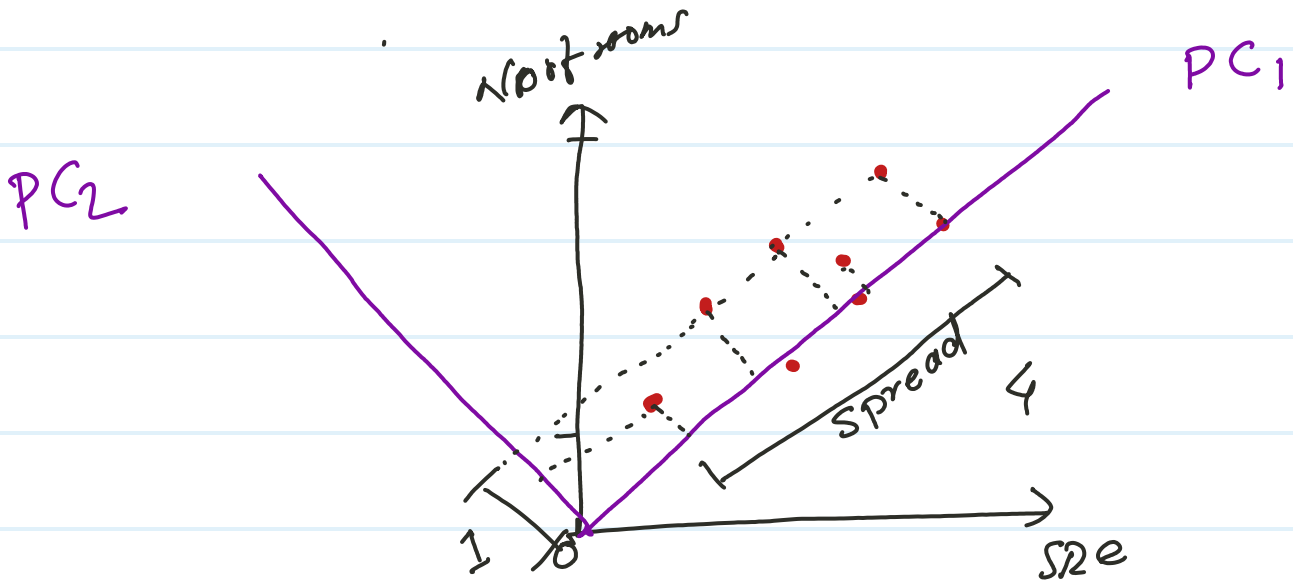
3d → 2d

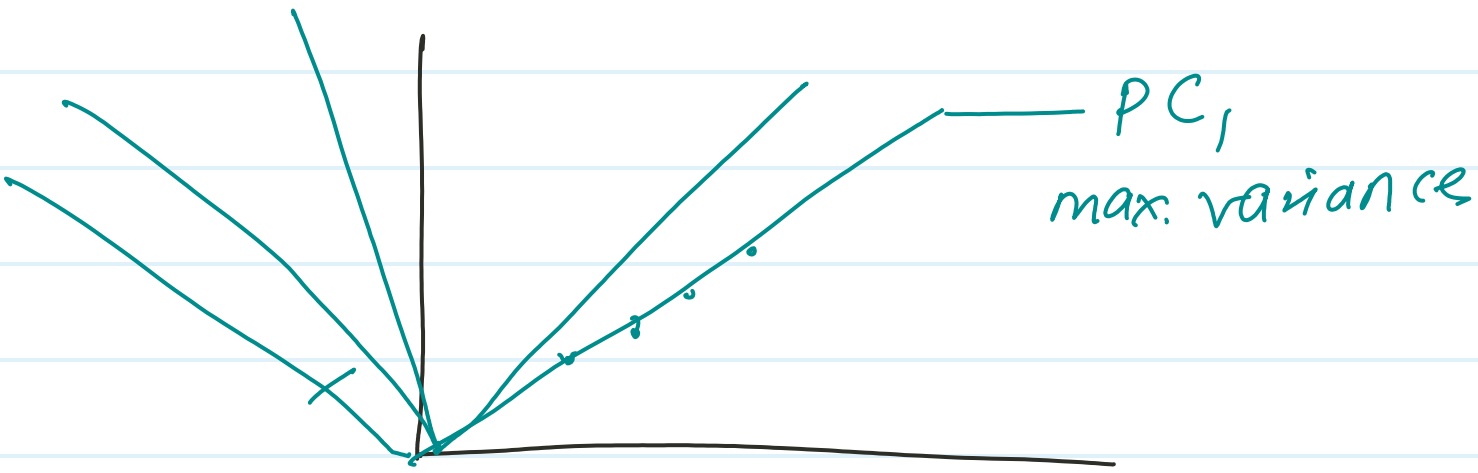




Geometric of PCA

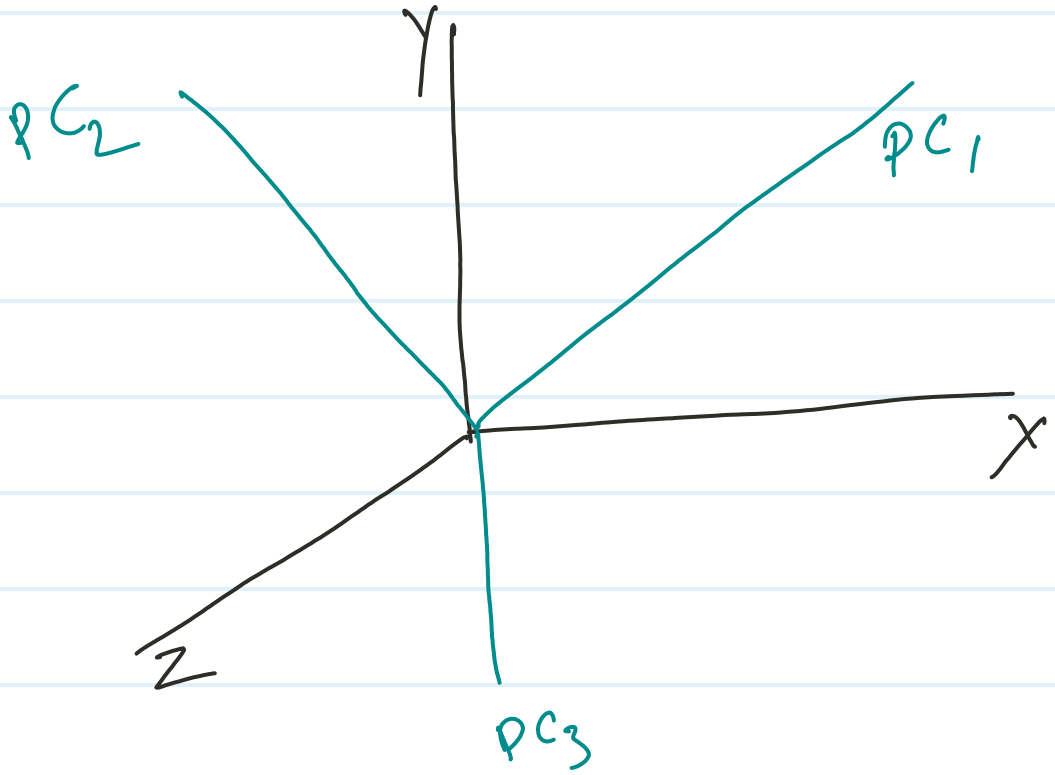




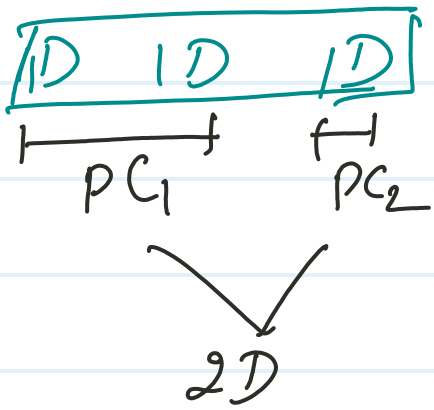


$PC_1 > PC_2 > PC_3$

$\text{var } pc_1 > \text{var } PC_2 > \text{var } PC_3$

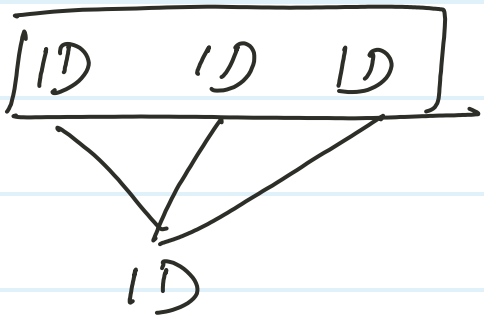


$PC_1 > PC_2 > PC_3$



3D − 2D

3D − 1D



Eigen value and Eigen vector

$$A \cdot V = \lambda \cdot V$$