



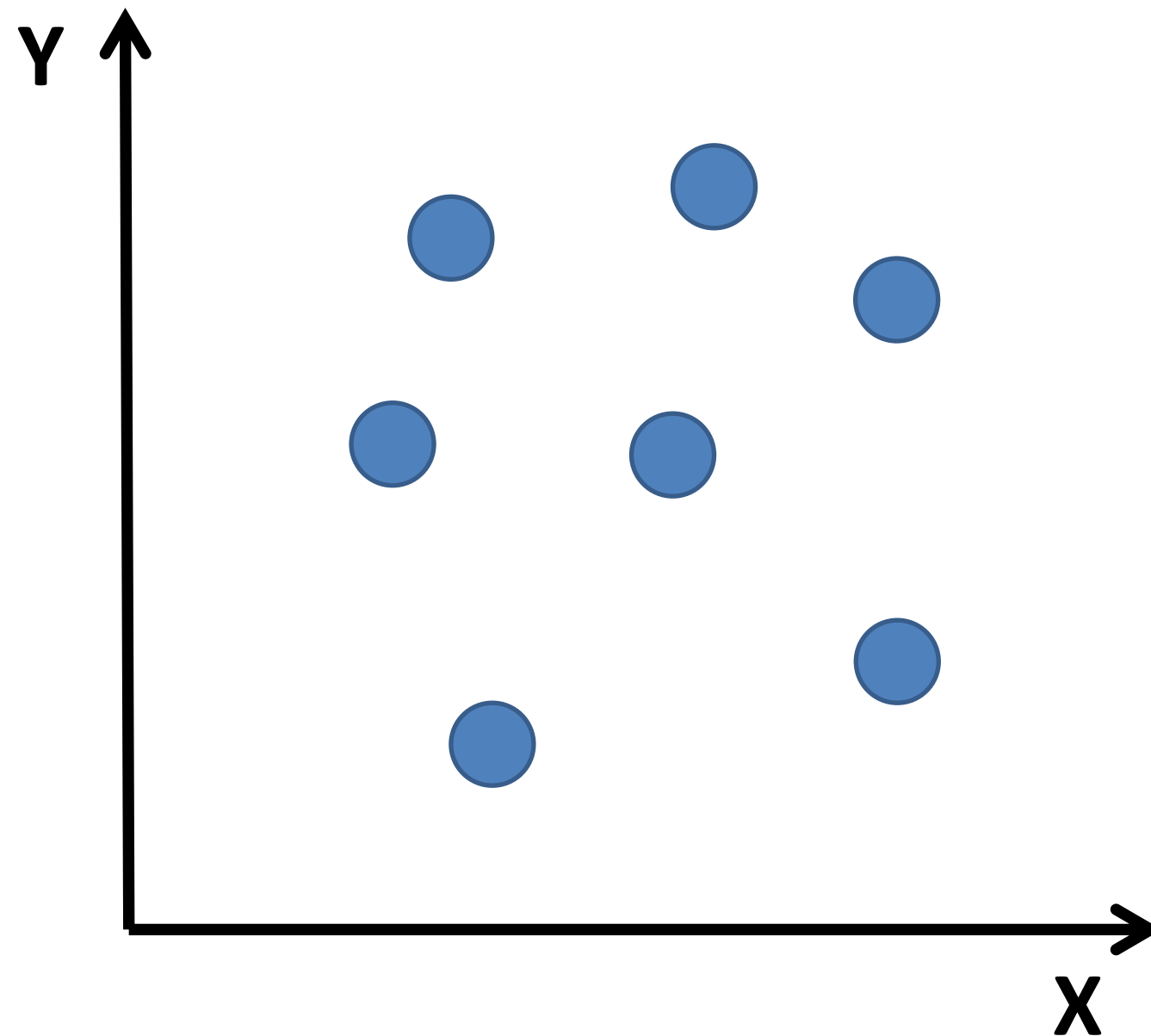
DICE
ANALYTICS

DATA SCIENCE & MACHINE LEARNING COURSE

<https://www.facebook.com/diceanalytics/>
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Dimensionality Reduction

Principle Component Analysis

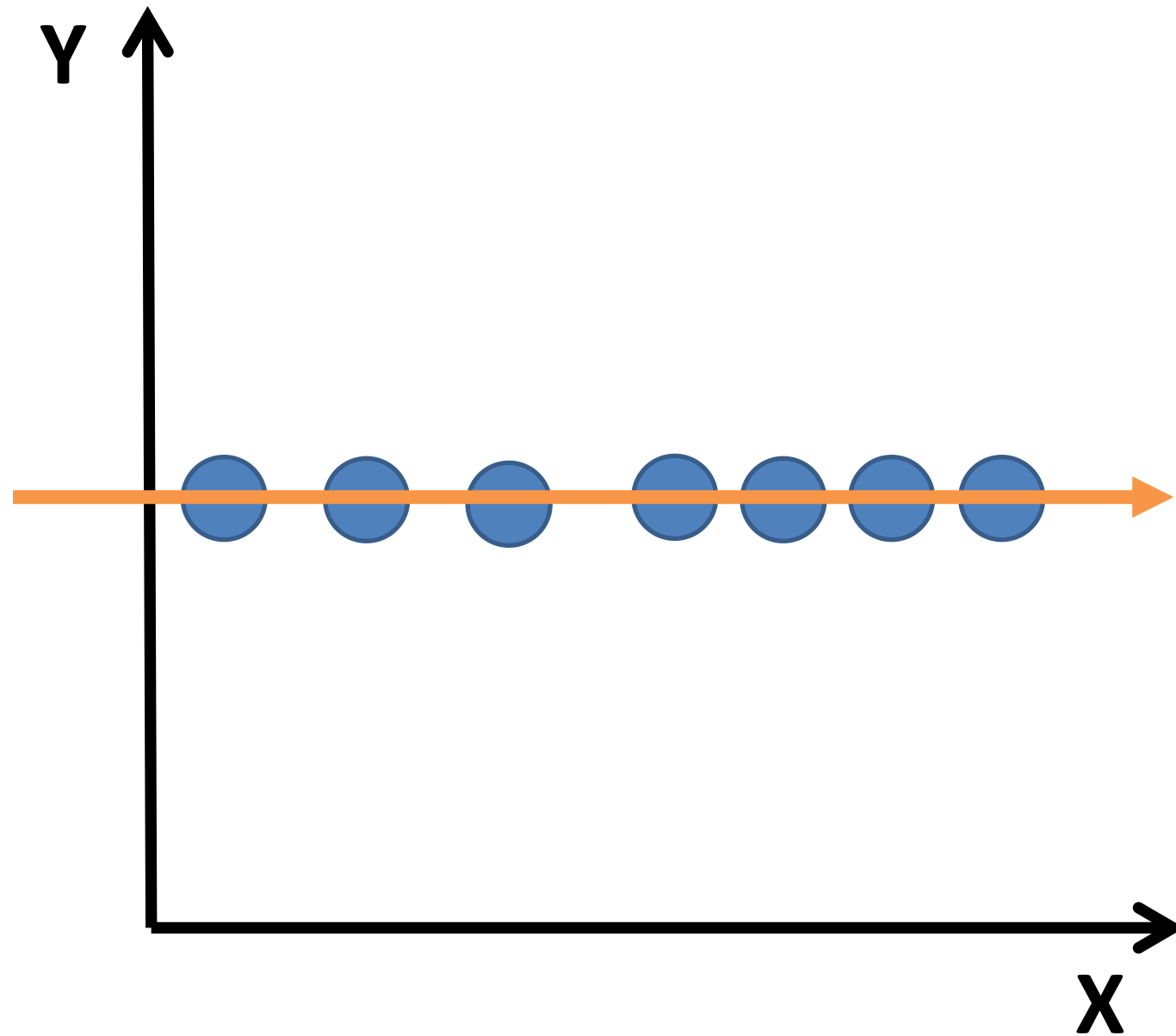


**What is the
Dimensionality of
this data?**

○ 1D

● 2D

Principle Component Analysis

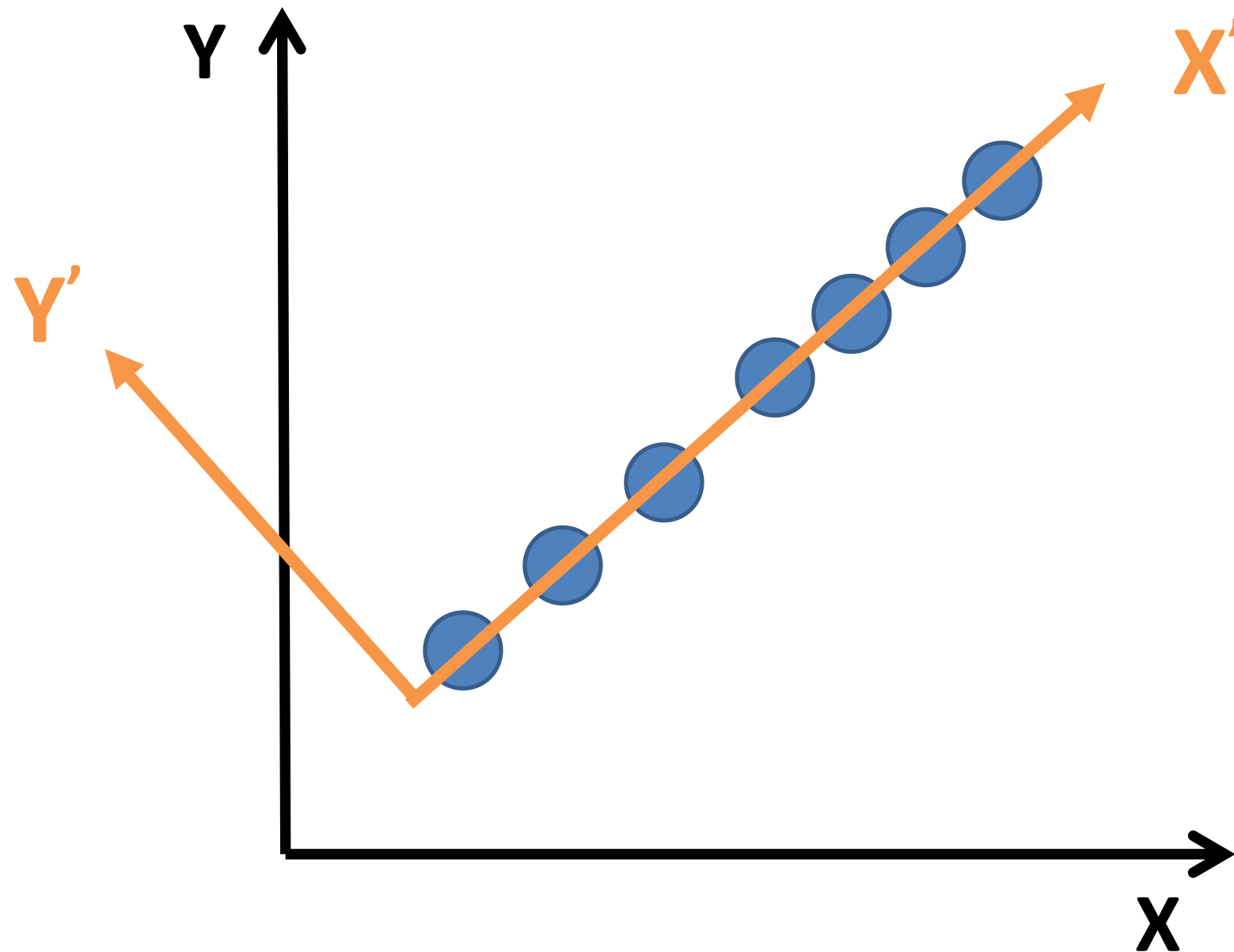


What is the Dimensionality of this data?

☒ **1D**

☐ **2D**

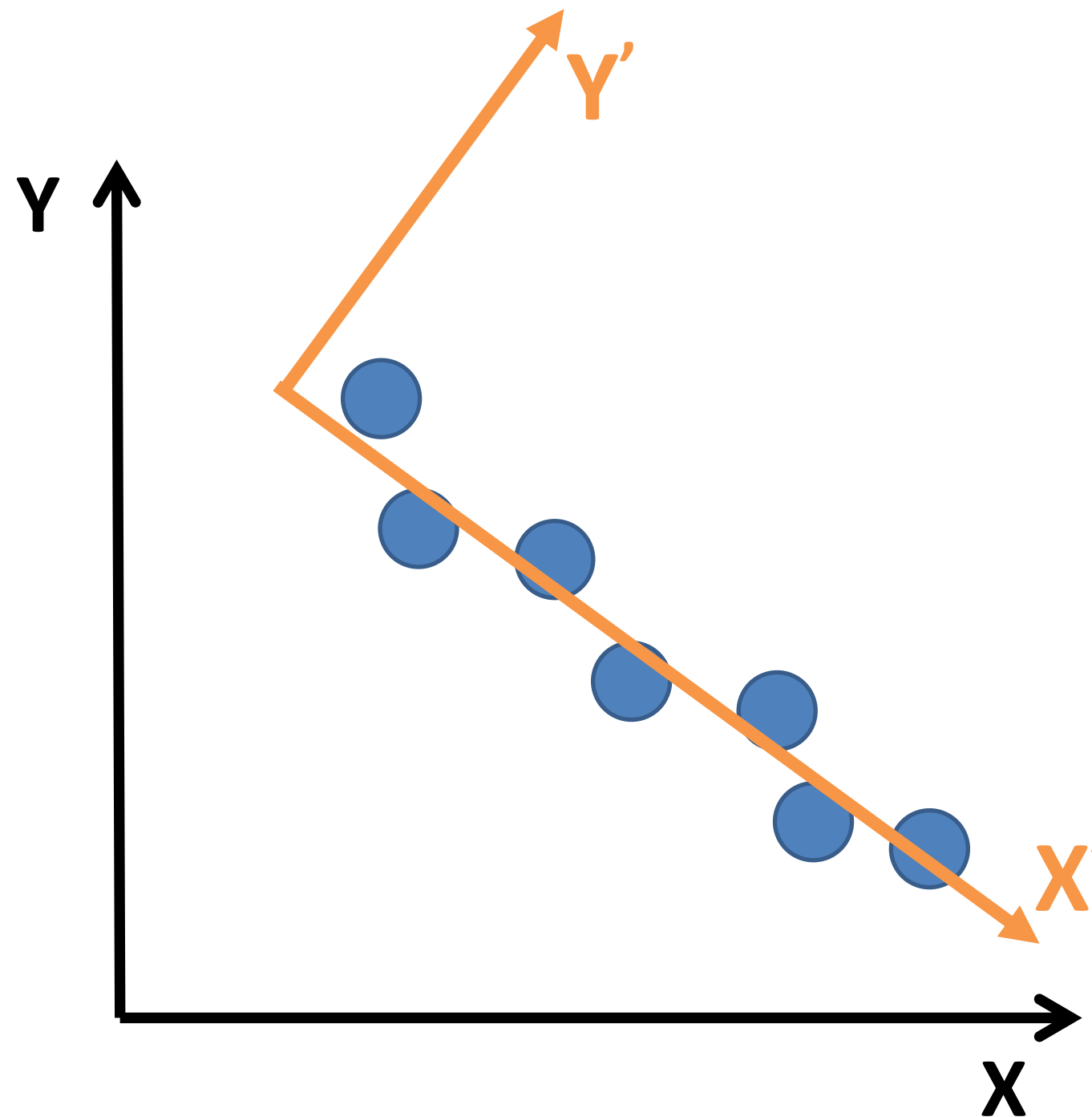
Principle Component Analysis





What is the Dimensionality of this data?

- ☒ 1D
- ☐ 2D

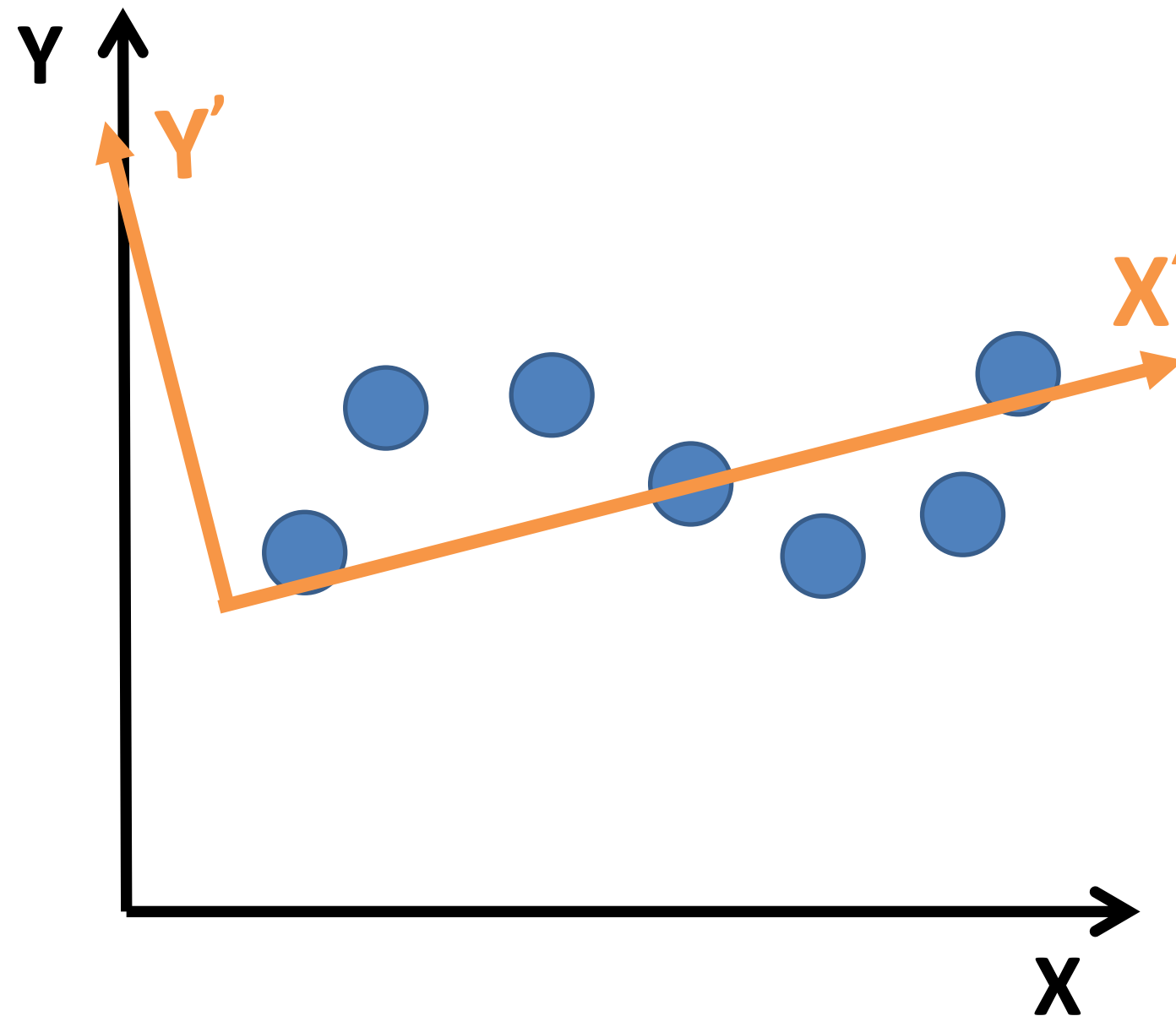
Principle Component Analysis



**What is the
Dimensionality of
this data?**

-  **1D**
-  **2D**

Principle Component Analysis

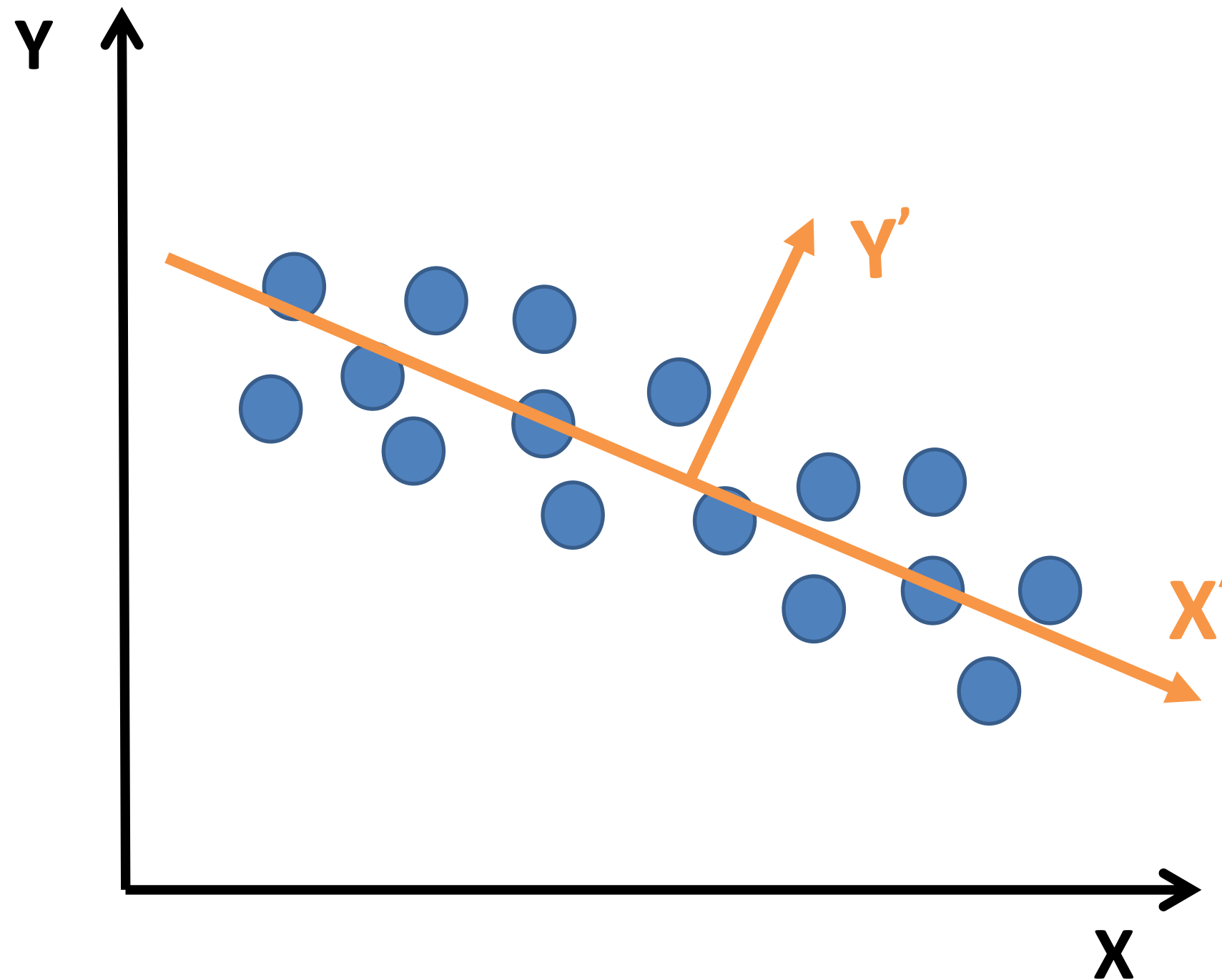


What is the
Dimensionality of
this data?

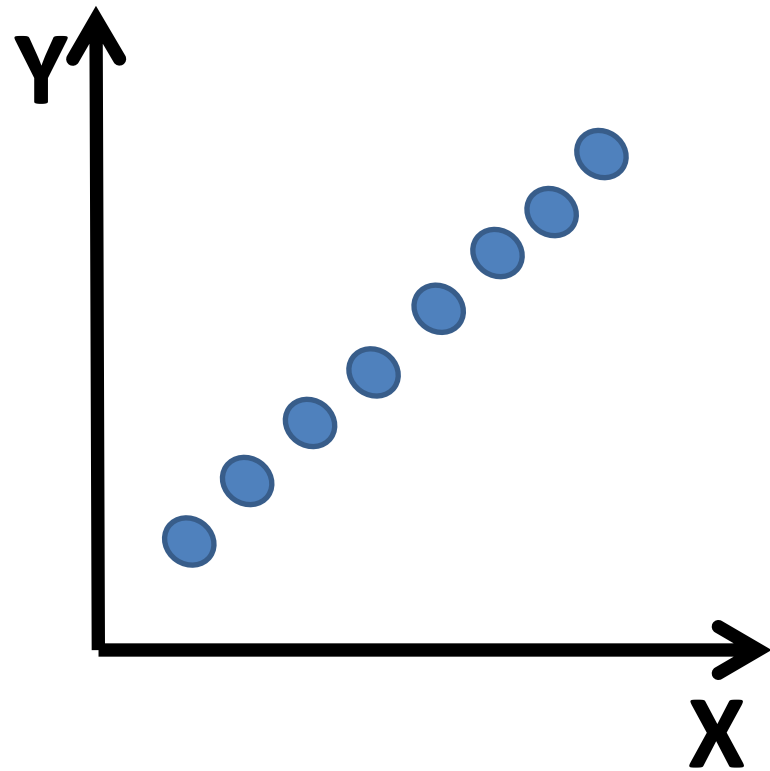
☐ 1D

☒ 2D

Principle Component Analysis

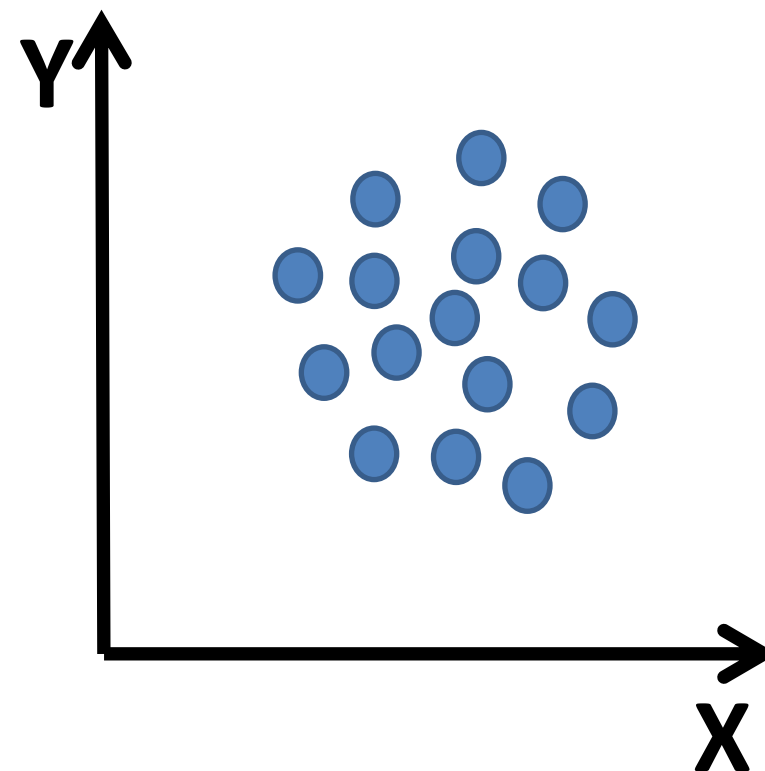


PCA Results?



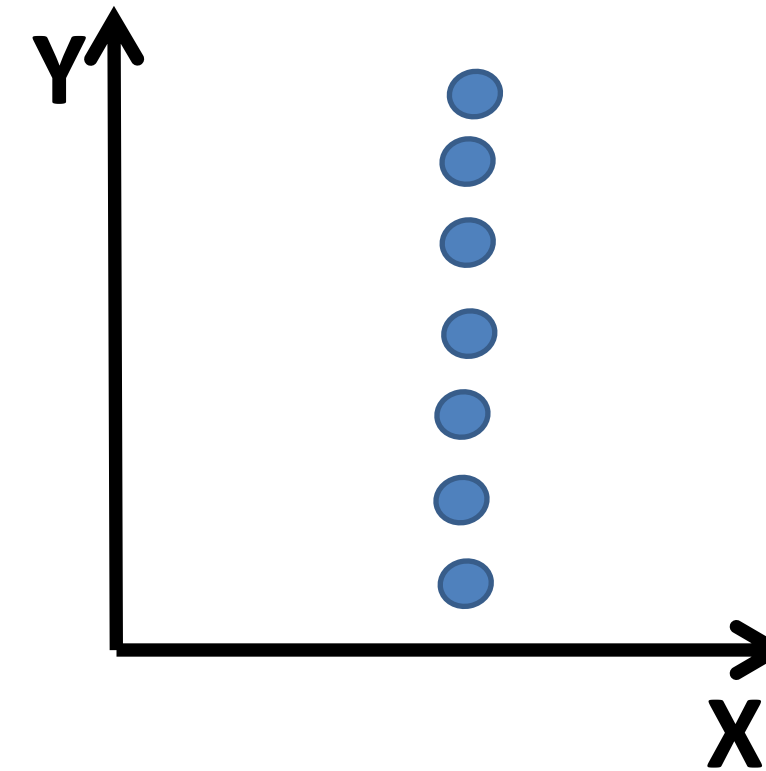
☒ YES

☐ NO



☒ YES

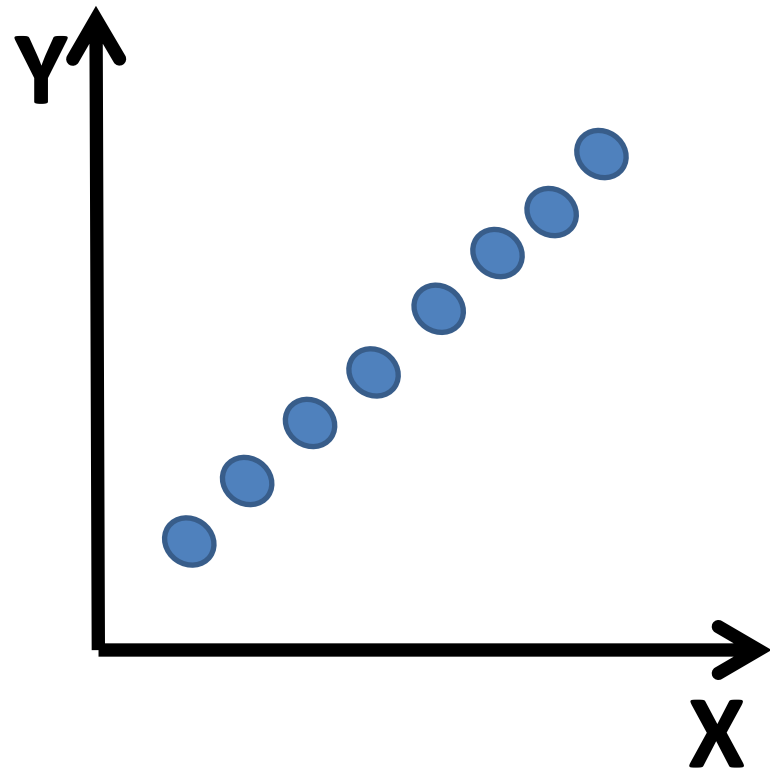
☐ NO



☒ YES

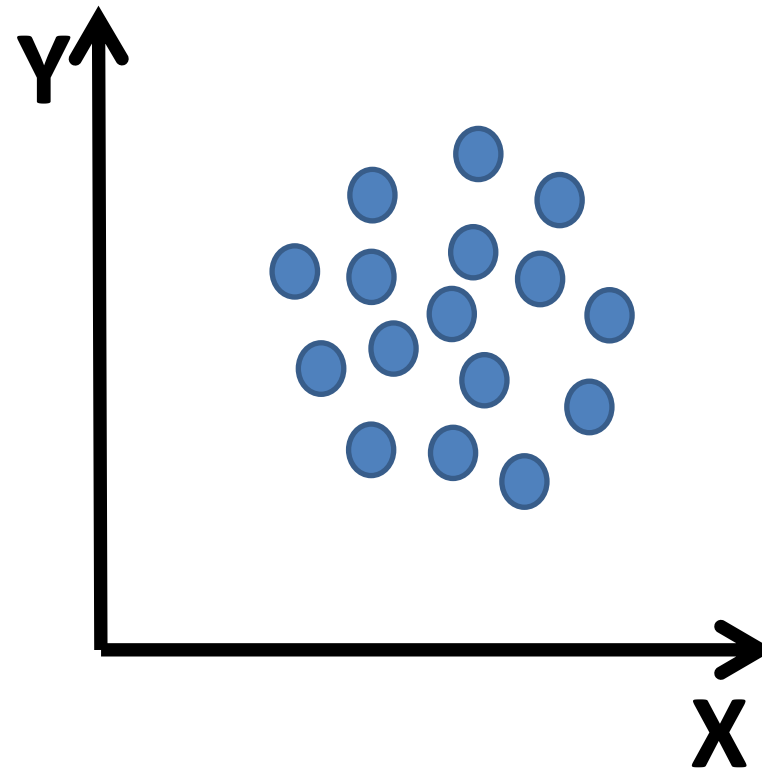
☐ NO

Major Axis Dominates?



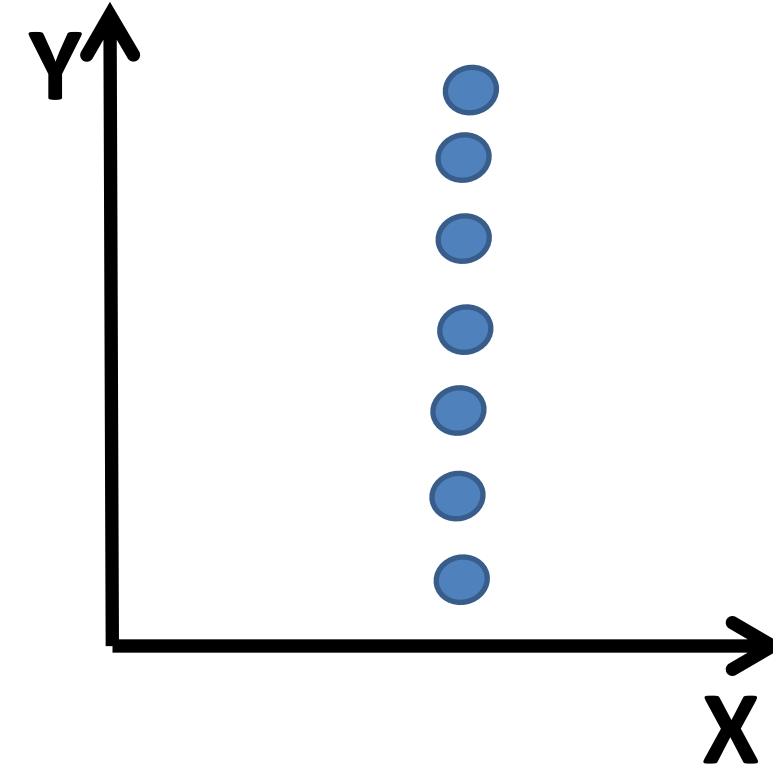
☒ YES

☐ NO



☐ YES

☒ NO



☒ YES

☐ NO

Measurable vs Latent Features

Given the features of house, what is its price?

Measurable Features	
<input checked="" type="radio"/>	Square Footage
<input type="radio"/>	School Ranking
<input type="radio"/>	Neighborhood Safety
<input checked="" type="radio"/>	No. of Rooms

Latent Features	
<div>Size</div>	
Neighborhood	

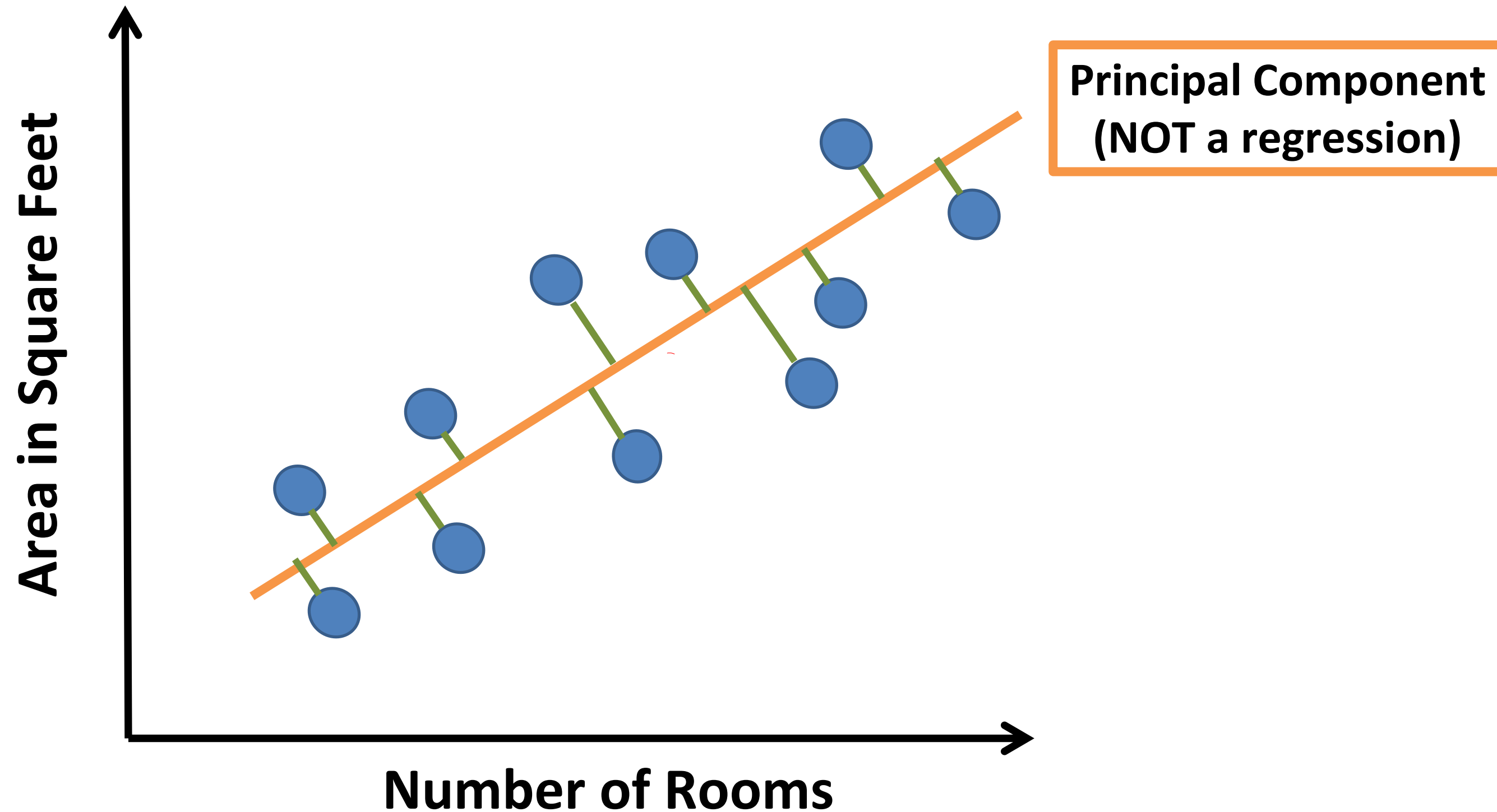
Measurable vs Latent Features

Given the features of house, what is its price?

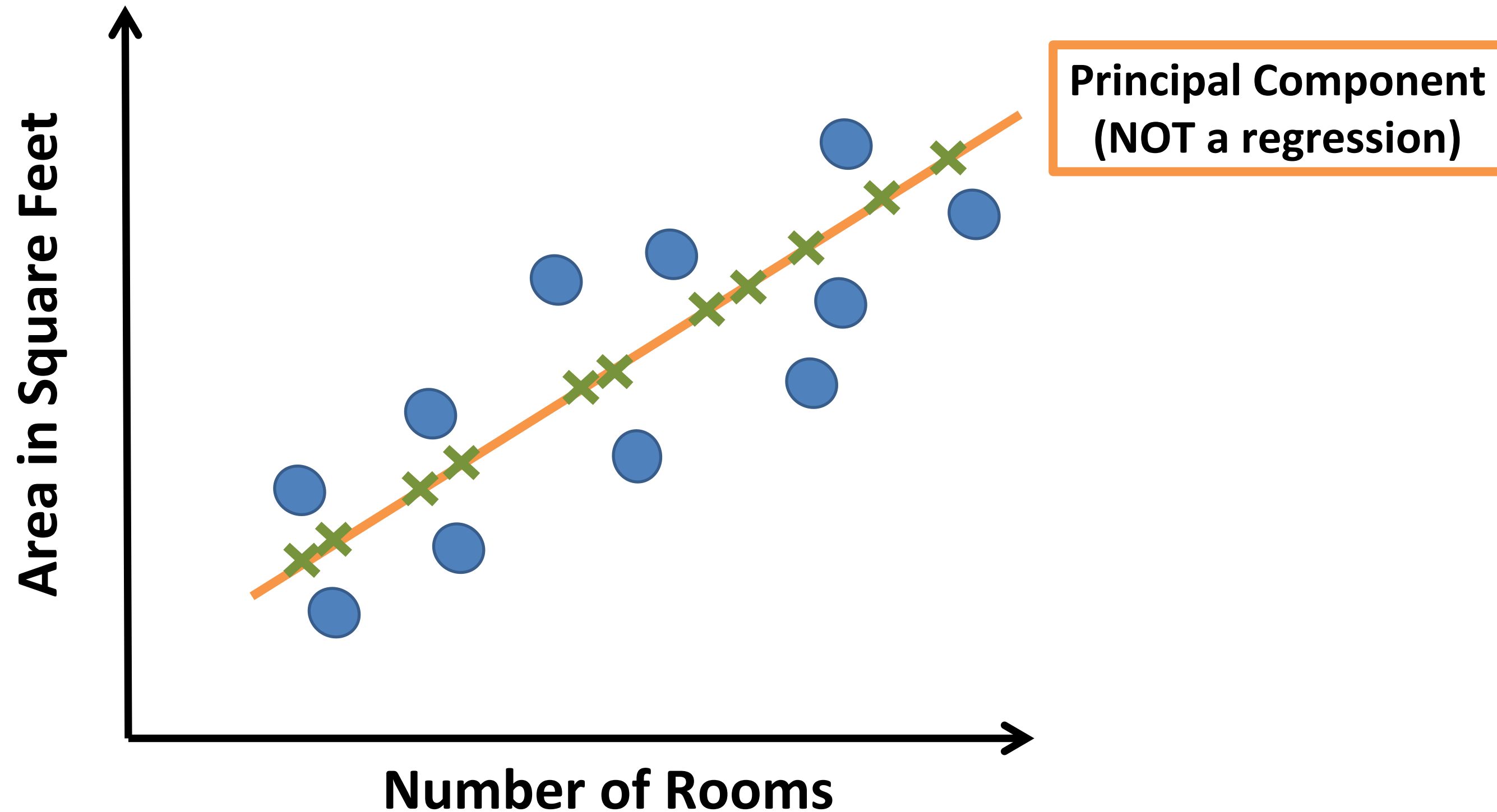
Measurable Features	
<input type="radio"/>	Square Footage
<input checked="" type="radio"/>	School Ranking
<input checked="" type="radio"/>	Neighborhood Safety
<input type="radio"/>	No. of Rooms

Latent Features
Size
<div>Neighborhood</div>

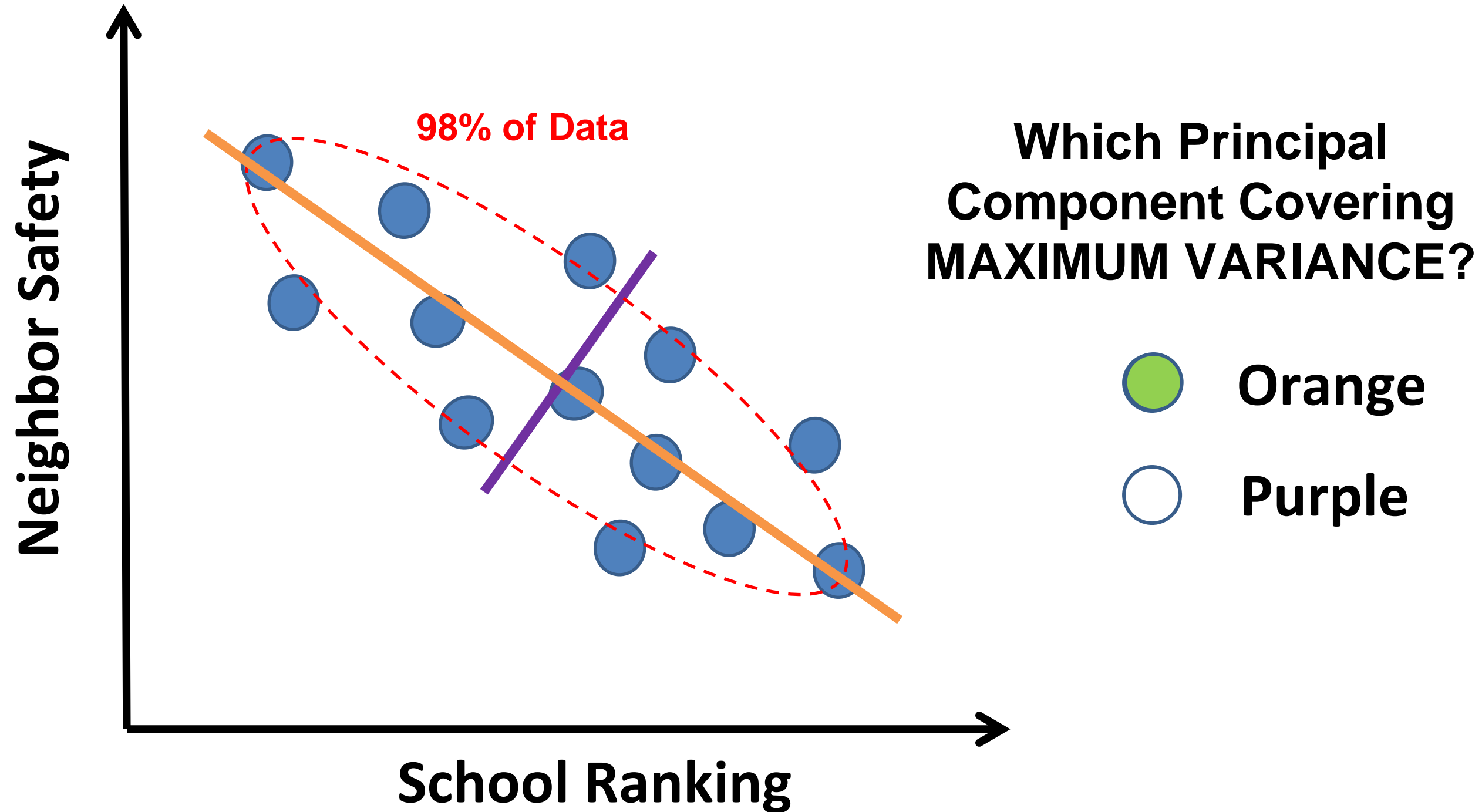
Preserving Information in Principal Component



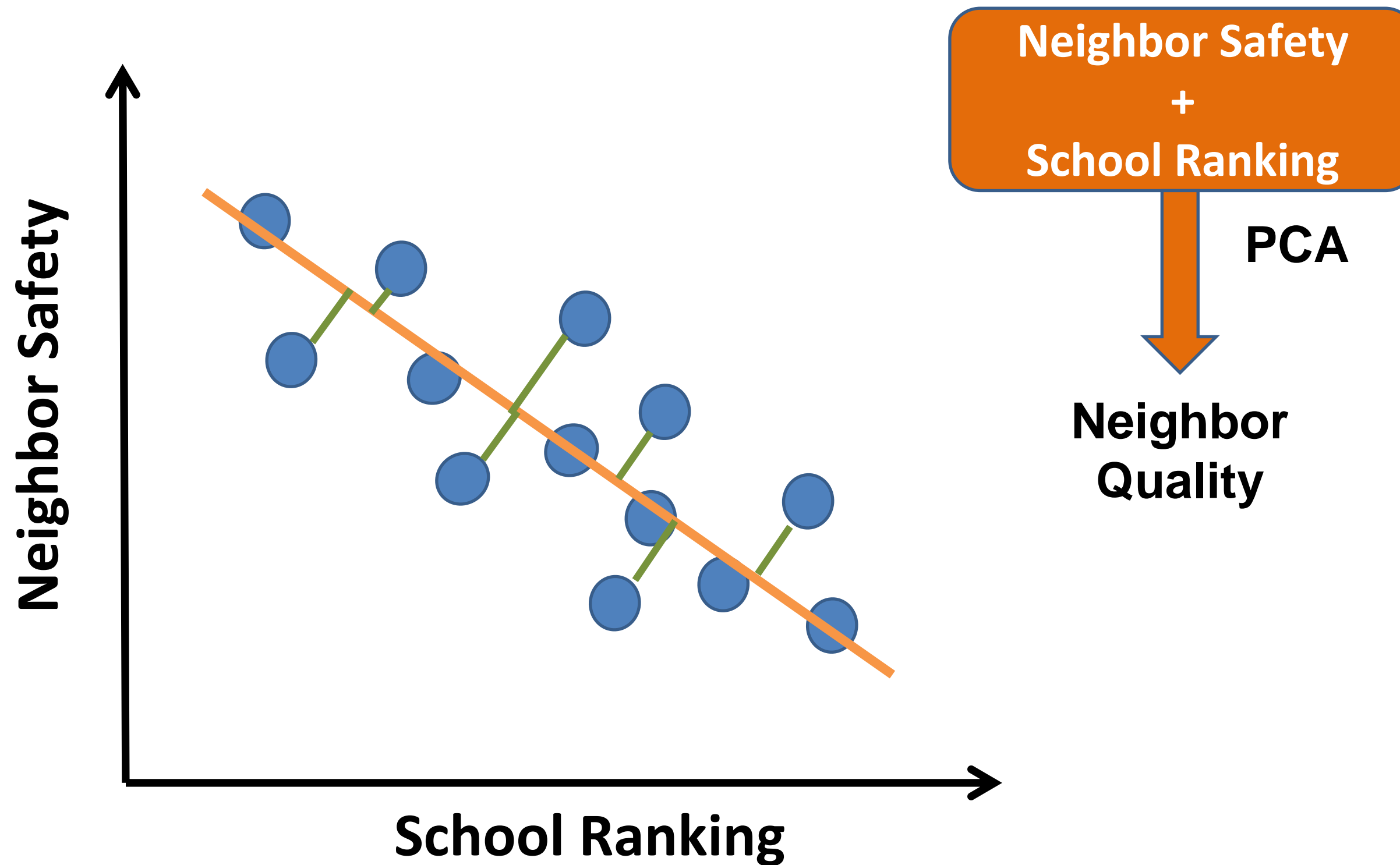
Preserving Information in Principal Component



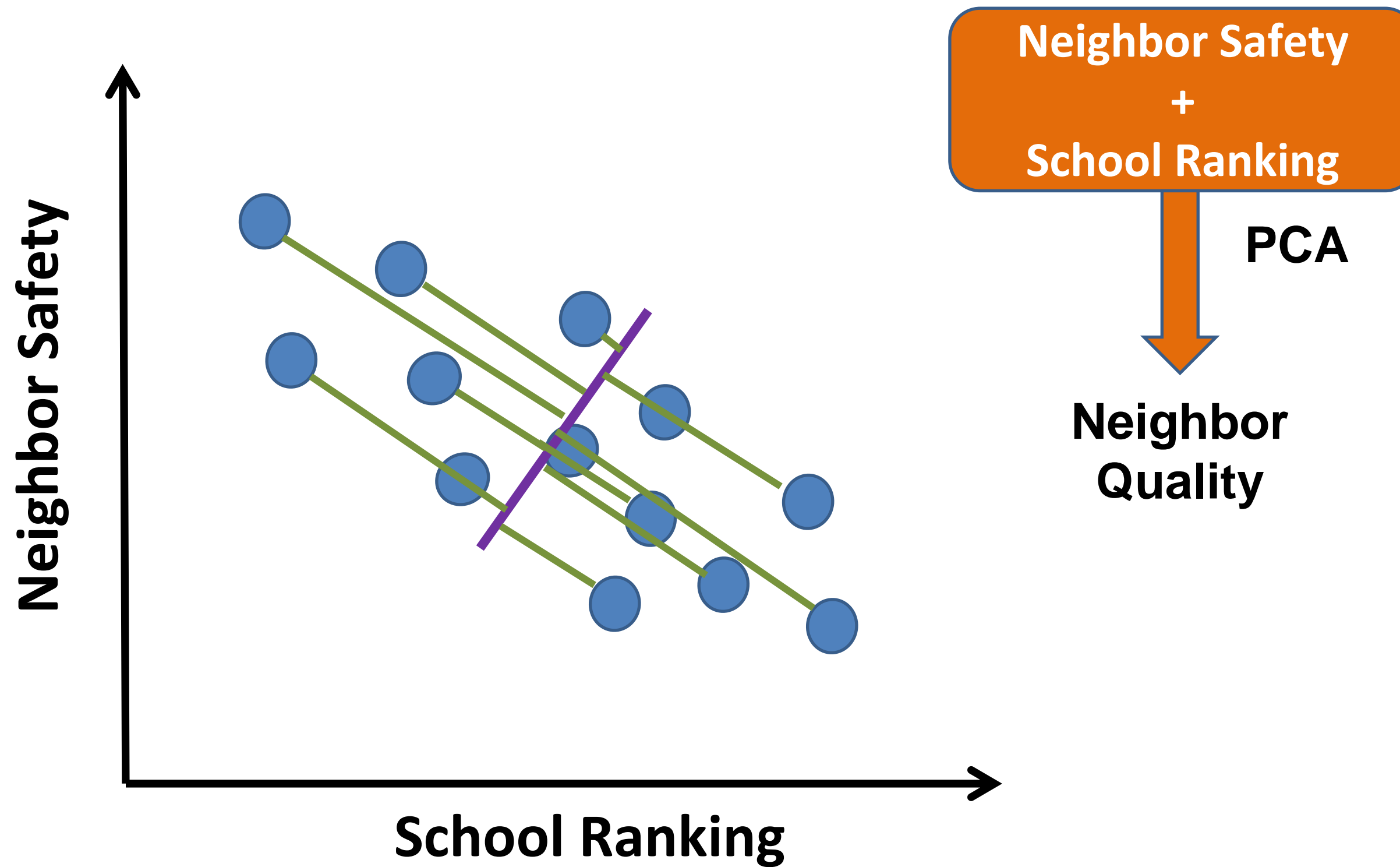
How to determine Principal Component



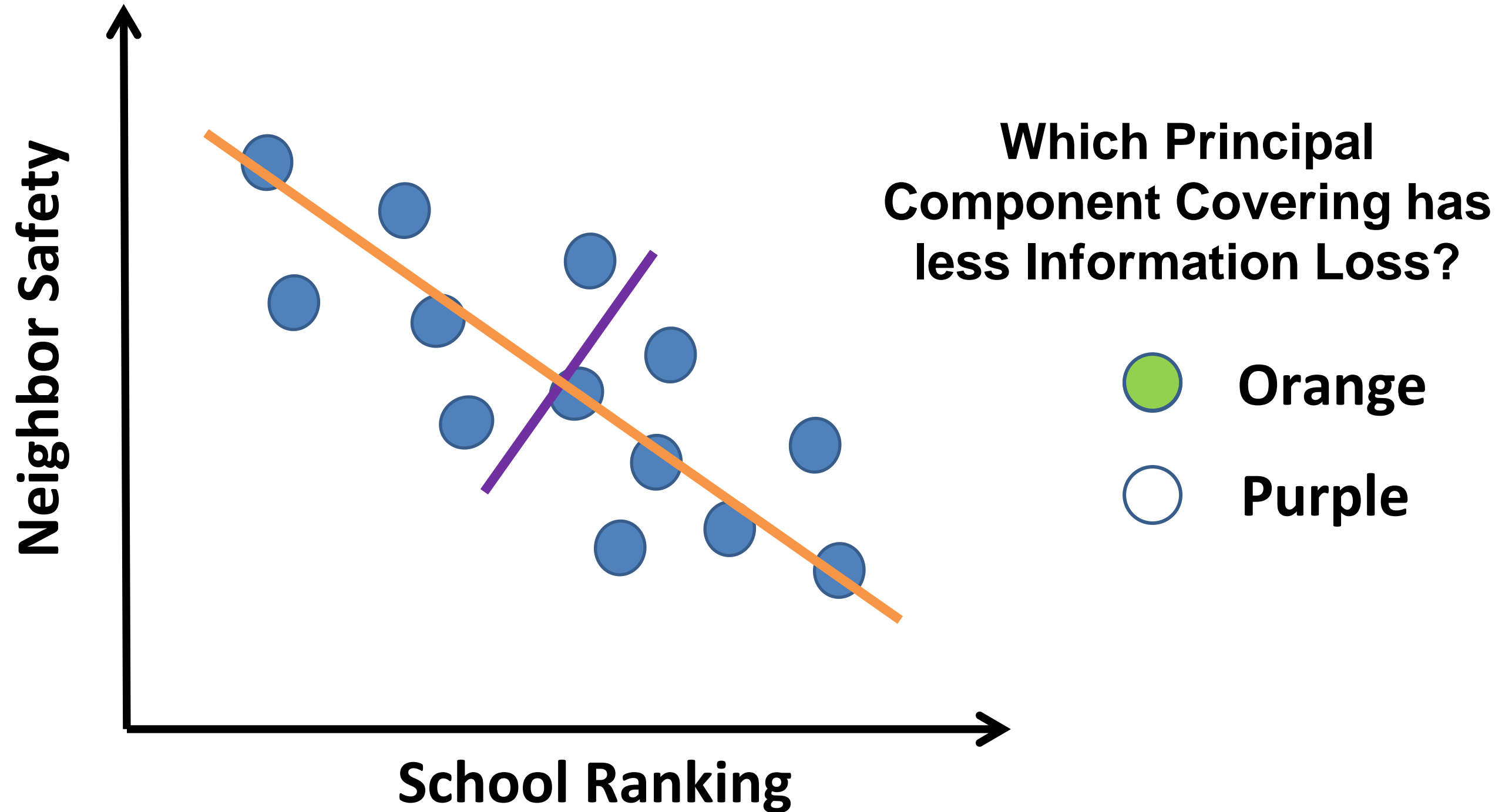
Maximum Variance & Information Loss



Maximum Variance & Information Loss



Maximum Variance & Information Loss



PCA as General Algorithm for Feature Transformation

