

Recitation Week 9

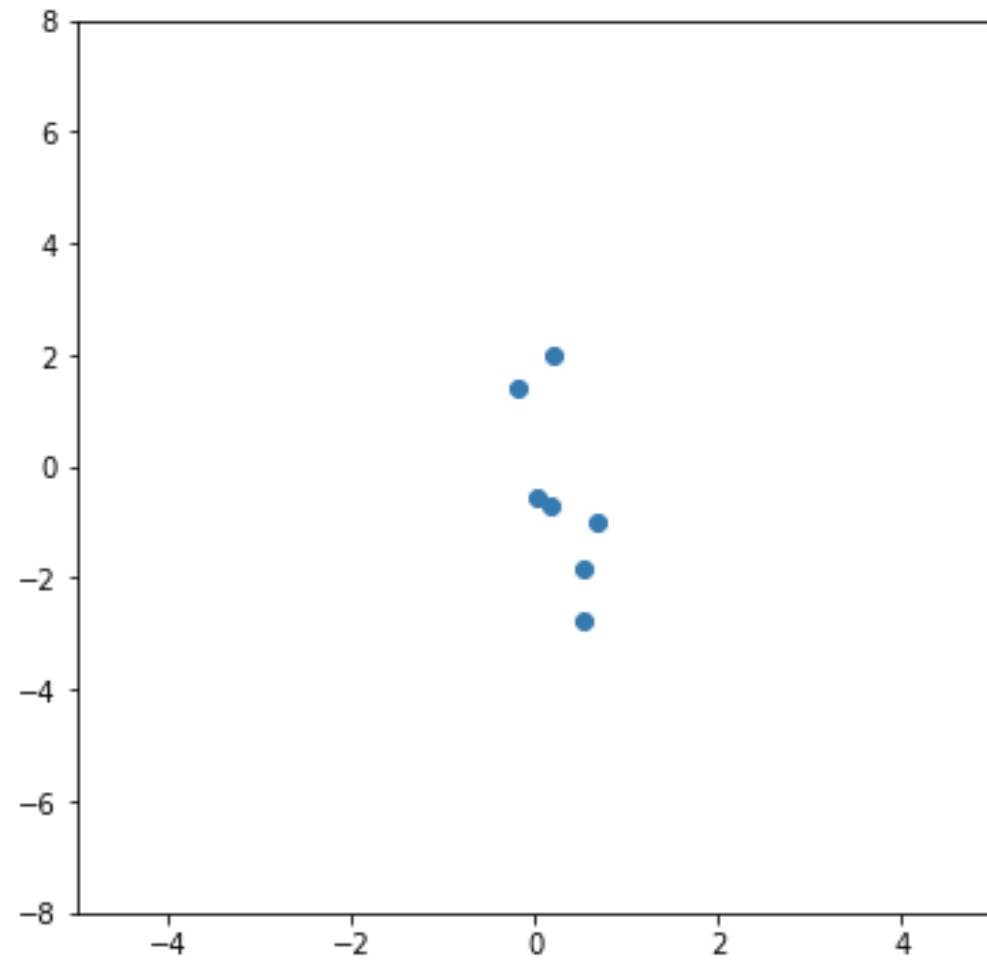
Ashwin Bhola

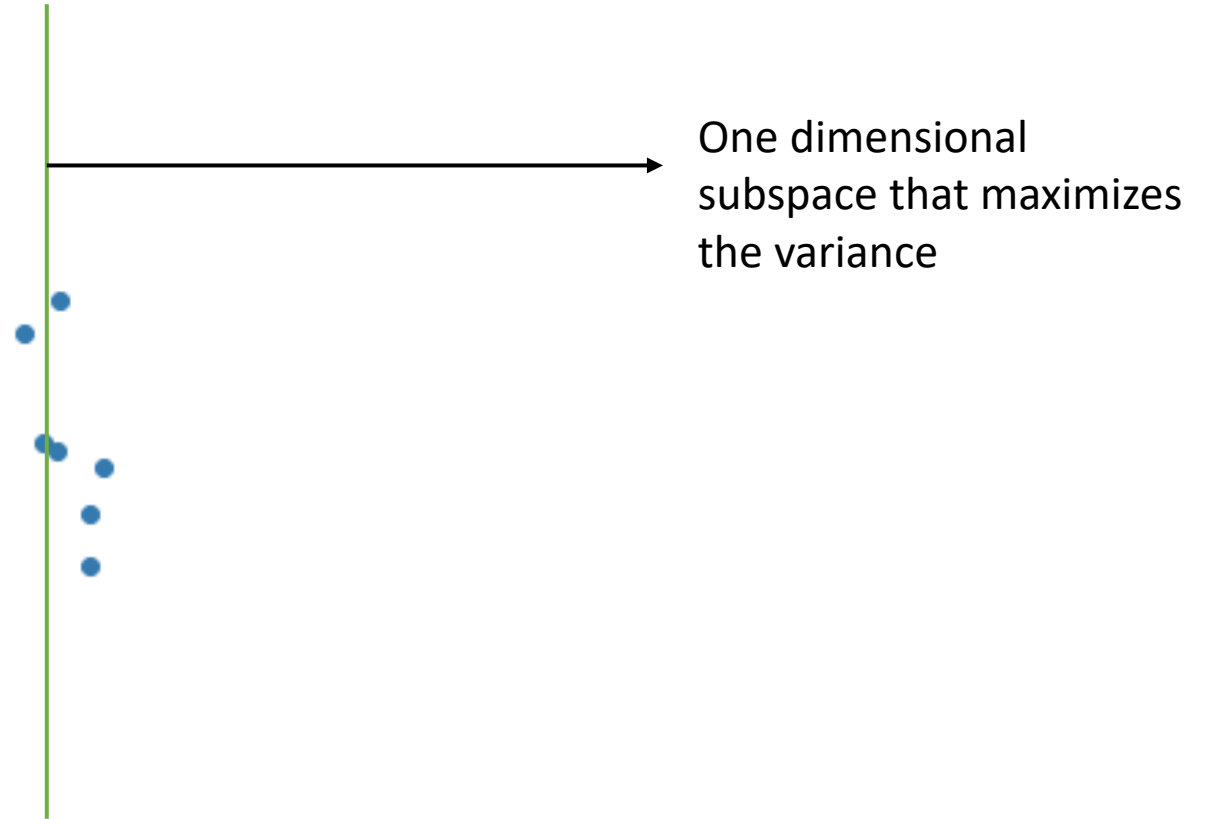
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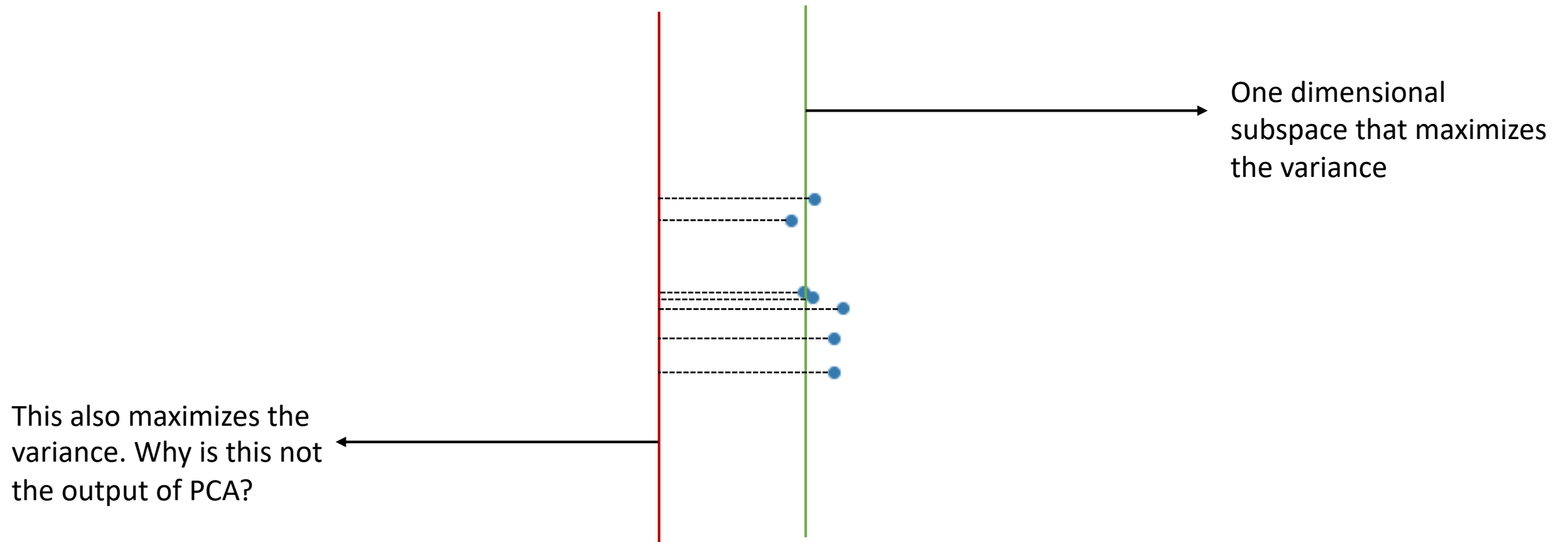
Oct 30th, 2019

1. Suppose $x_1, \dots, x_n \in \mathbb{R}^d$ are datapoints you want to represent in $k < d$ dimensions.
 1. Explain how to do this using PCA
 2. How can you implement PCA using SVD?
 3. How to determine an optimal value for k ?

1. Let $X \in \mathbb{R}^{n \times d}$ be your matrix of data points. Suppose you are implementing PCA. Someone suggests that you should standardize your data before calculating the eigenvalues. How do you standardize the data? Is it really required?







1. PCA can also be thought of as finding a d -dimensional affine space such that the sum of l_2 distance between the data points and their projection on the affine space is minimum. How to formulate this optimization mathematically?

