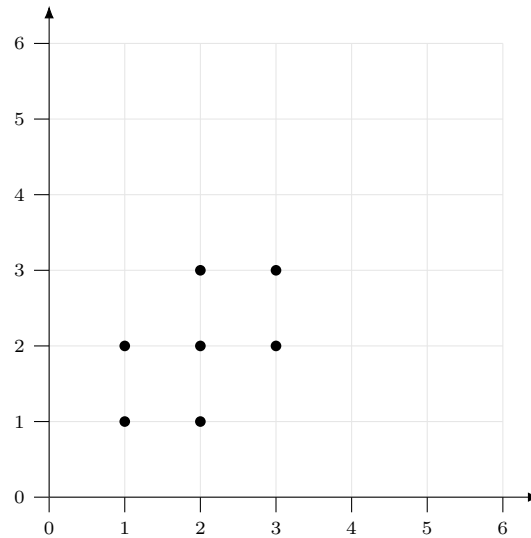Prof. Dr. Leif Kobbelt
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Theoretical Exercise 2

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Exercise 1 Dimensionality Reduction

(a) PCA

Compute a 1D embedding of the dataset below using PCA.

(b)   MDS

What assumption does MDS make about the distance matrix? What can happen if that assumption does not hold?

(c)   IsoMap

How do we need to choose the neighbourhood size k in order for IsoMap to be able to preserve the structure (unrole the spiral), when embedding the dataset onto a 1D line?
What happens if we choose k smaller?
What happens if we chosse k bigger?