

Microsoft: DAT210x Programming with Python for Data Science

4. Transforming Data > Lecture: Isomap > Knowledge Checks **Bookmarks** ■ Bookmark **Review Question 1** Start Here ▶ 1. The Big Picture (1/1 point) Which of the following explanations of isomap is true? 2. Data And Features Isomap can be used as a powerful noise removal tool, since a smooth manifold is created by • 3. Exploring Data "short circuiting" the nearest neighbor map when calculating distances ▼ 4. Transforming Data Isomap is usually faster than PCA because it's quicker to compute a nearest neighbor map than to do matrix decomposition Lecture: Transformations Lecture: PCA A one sentence summary of isomap's implementation is that at its core, it is essentially a node Quiz distance map that has been fed into a special type of PCA Lab: PCA Lab Isomap will not function without a completely accurate distance metric, since it needs to know **Lecture: Isomap** the precise distance to every single sample, including distant ones Quiz Lab: Isomap Lab **Lecture: Data Cleansing EXPLANATION** Quiz

Dive Deeper

▶ 5. Data Modeling

One of isomap's greatest weaknesses is that noisy data might short circuiting the actual geodesic path. In such cases, isomap will prefer the noisy path to the actual path and produce an incorrectly warped mapping.

Isomap is slower than PCA because isomap essentially implements a multi-dimensional scaling (similar to PCA) through projection; but in addition to that, it also has to calculate the nearest neighbor map.

As mentioned in the lecture, even if the distance metric isn't 100% accurate, isomap can still function reasonably. Particularly for distant nodes, they won't be included in the *nearest* neighbors list to start with.

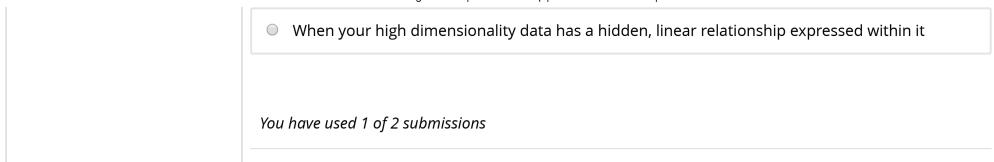
You have used 2 of 2 submissions

Review Question 2

(1/1 point)

Isomap is most beneficial...

- When your data lacks an inherent manifold
- When a non-linear, geometric structure is expressed in your data
- When you are uncertain how many samples are needed to capture the underlying nature of your data



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