

**Microsoft: DAT210x Programming with Python for Data Science**

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## 1. The Big Picture &gt; Lecture: The Possibilities &gt; Dimensionality Reduction

**Dimensionality Reduction (Unsupervised)**

The goal of dimensionality reduction is to systematically and intelligently reduce the number of features considered in a dataset. Stated differently, trim the fat off. Often times, in the eagerness to collect enough data for machine learning to even be effective, one might add unnecessarily correlated or even irrelevant features to the collection list. These bad features have the effect of hindering the machine learning process, and also make your data harder to conceptualize. Dimensionality reduction boils off what aspects of your dataset are considered for decision making to its bare essentials.

Processor GHz?

Octocore?

Bus GHz?

RAM GHz?

RAM GB?

HDD GB?

Graphics Card GHz?

Graphics Card GB?

Display Resolution?

Display Hz?

64Bit?

Touch Screen?

Big Screen?

Light Weight?

Is It Good?

### More Examples

- Given a 100 question survey, attempt to identify the gist of what is truly being accessed; then rephrase it in just 5 questions.
- Build a robot that can recognize pictures of similar objects, even if they are rotated at odd angles and orientations.
- Compress a video stream by reducing the number of colors.
- Summarize a long book.

Dimensionality reduction falls into the realm of unsupervised learning because you will not be the one telling the computer which features you want it build. Rather, it will infer this information automatically by examining your unlabeled data.

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