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Machine Learning Notes

Welcome to Machine Learning

* Machine learning is the science of getting computers to learn, without being explicitly programmed.
* Neural networks mimic how the human brain works. These type of “learning algorithms” can help make truly intelligent machines.

**Introduction**

Welcome

* Machine learning grew out of work in AI.
* Aimed to provide a new capability for computers
* Examples of uses of Machine Learning:
  + Database mining: processing large datasets
  + Applications that can’t be programmed by hand
  + Self-customizing programs. (e.g. product recommendations)
  + Understand human learning

What is Machine Learning?

* Arthur Samuel’s definition: field of study that gives computers the ability to learn without being explicitly programmed.
* Tom Mitchell’s definition: A computer program learns from experience E with respect to some task T and some performance measure P, if its performance on T, as measured by P, improves with experience E.
* Machine learning algorithms:
  + Supervised learning: teach the computer how to do something.
  + Unsupervised learning: let the computer learn by itself.
  + Other algorithms: reinforcement learning and recommender systems

Supervised Learning

* Example: apply a regression line (linear, quadratic, etc) to a data set to interpolate a point.
* In supervised learning, you are provided the “right answers” for certain inputs.
* Regression: predict a continuous valued output
* Classification problem: identifying which discrete category an example belongs to.
  + Or rather might find the chance that the example might belong to each category