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**Week 1: Introduction, Univariate Linear Regression and Linear Algebra**

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**Definitions of ML**

* "the field of study that gives computers the ability to learn without being explicitly programmed."
* "A computer program is said to learn from experience E with respect to some class of tasks T and performance measure P, if its performance at tasks in T, as measured by P, improves with experience E."

**Types of ML**

* Supervised (Dataset with Correct Outputs)
  + Regression (Continuous Value)
  + Classification (Discrete Status)
* Unsupervised (no idea what our results should look like, no feedback from prediction results)
  + Clustering (Structure)

**Notations**

* Training Set, Training Example
* x(i): Inputs
* y(i): Outputs
* m: Size of Training Set

**Model Representation of Univariate Linear Regression**

* Linear Regression
  + Hypothesis Function (Task to Set Parameters)
* Cost Function (Performance Measurement)
  + Squared Error Function
* Gradient Decent (Parameter Learning)
  + Assignment
  + Learning rate
  + Derivative
  + Simultaneous Update

**Linear Algebra**

* Simple, Efficient
* Addition, Multiplication
  + Not Commutative
  + Associative
* Inverse (Nonsingular Squared Matrix)
* Transpose

