Machine Learning

Introduction
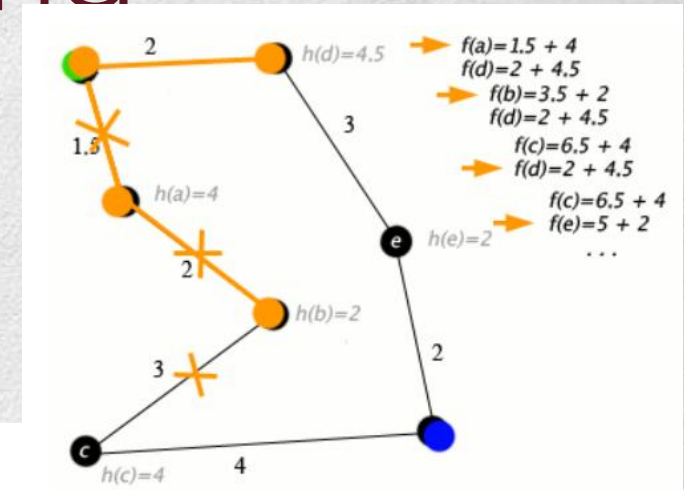
Peter Loux Sr.

What is Machine Learning?

A subfield of artificial intelligence.

"learning from data and generalizing to unseen data to perform tasks without explicit instructions"
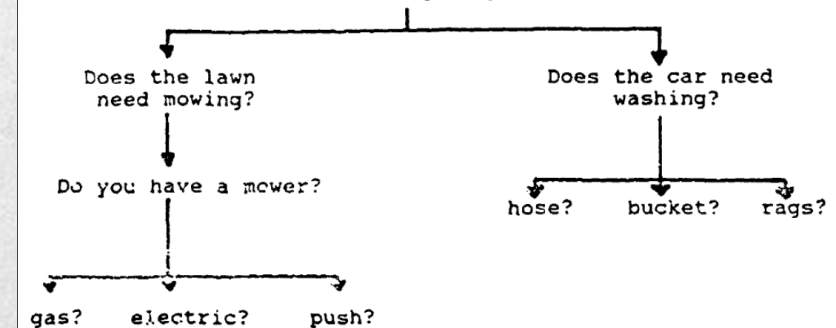
AI vs Machine Learning

- AI (but not ML)
  - genetic and evolutionary algorithms
  - rule-based systems
  - fuzzy logic
  - search algorithms
  - logical inference
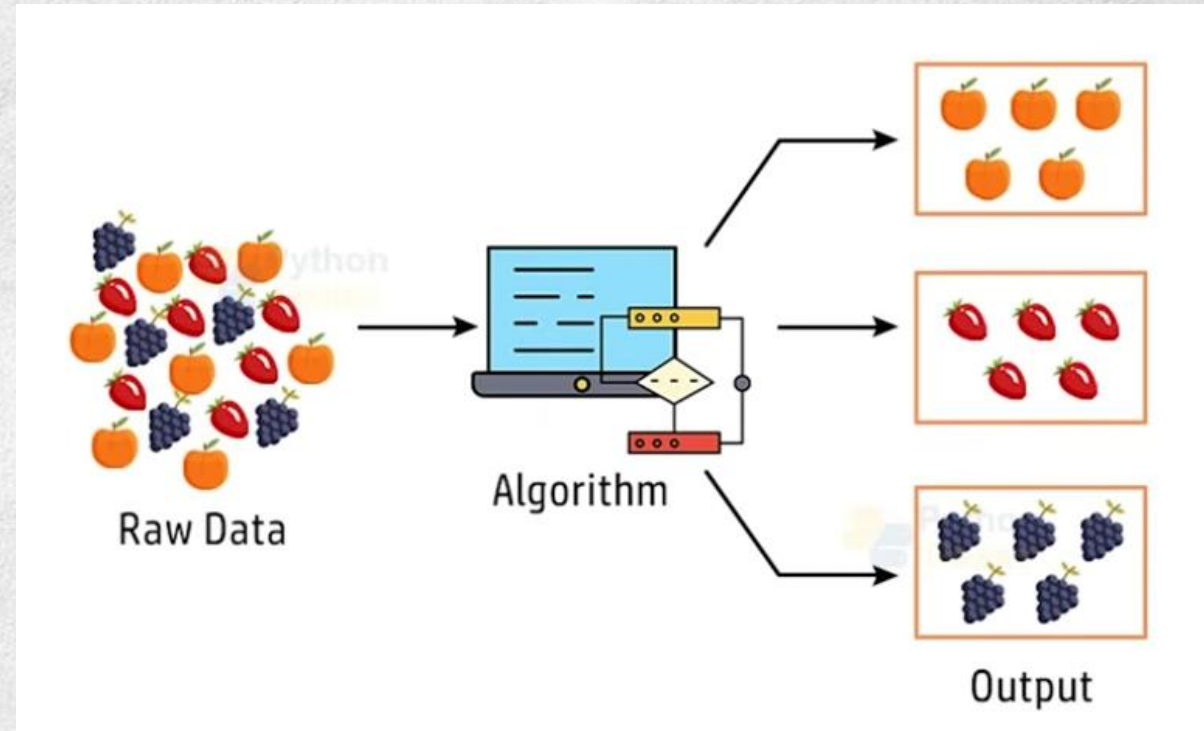 - brute force (mimicking human behavior)
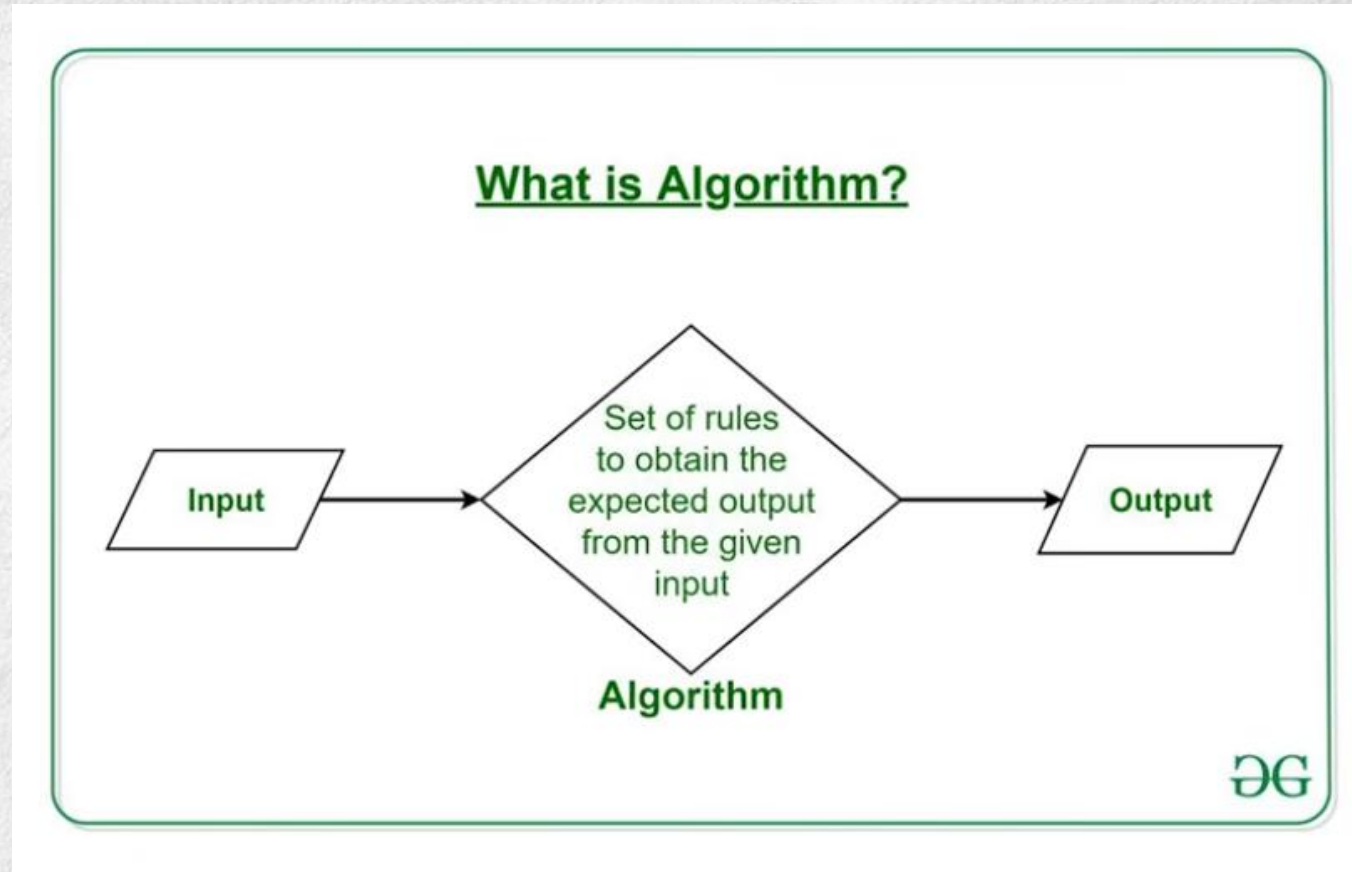
Machine Learning vs Deep Learning

- ML (but not DL)
  - linear regression
  - random forests
  - SVM
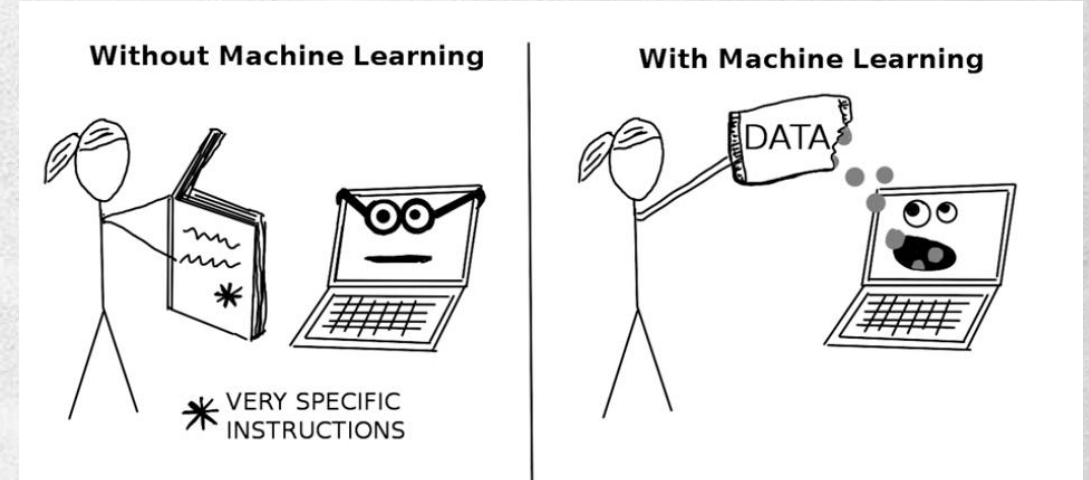 - clustering
- DL
  - multilayer neural networks

Algorithm

- Sorting
- Searching
- Arithmetic
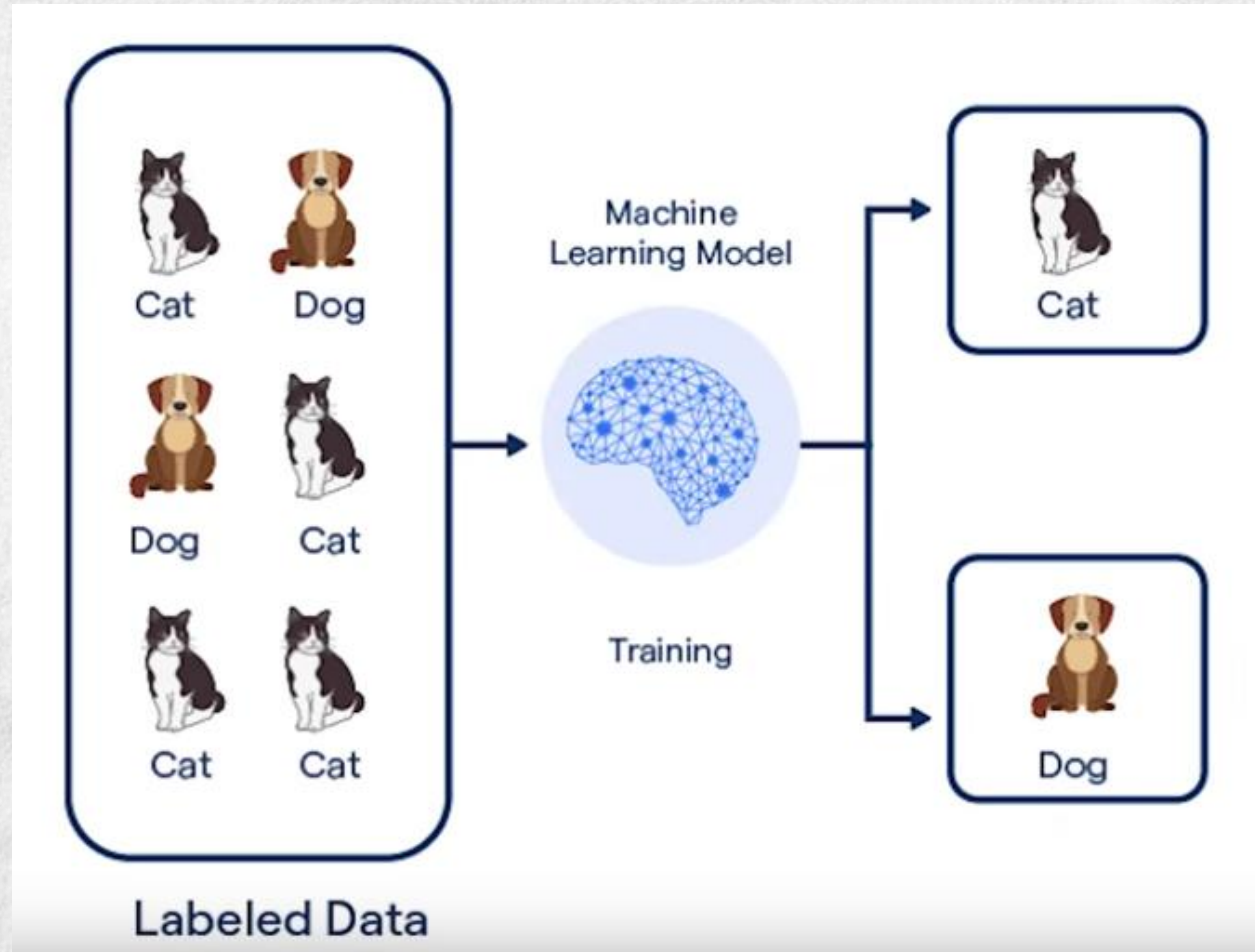- Sandwich making
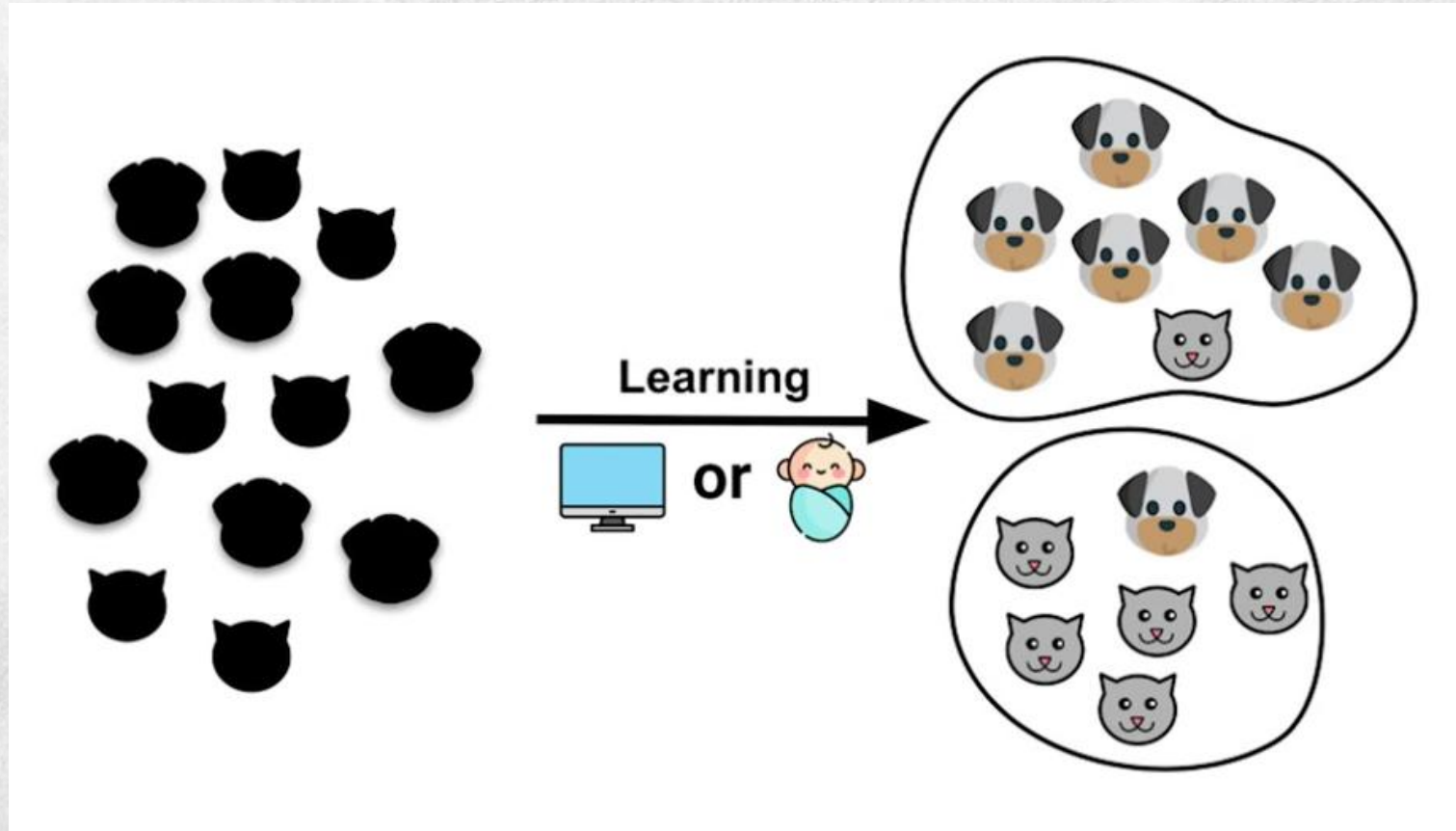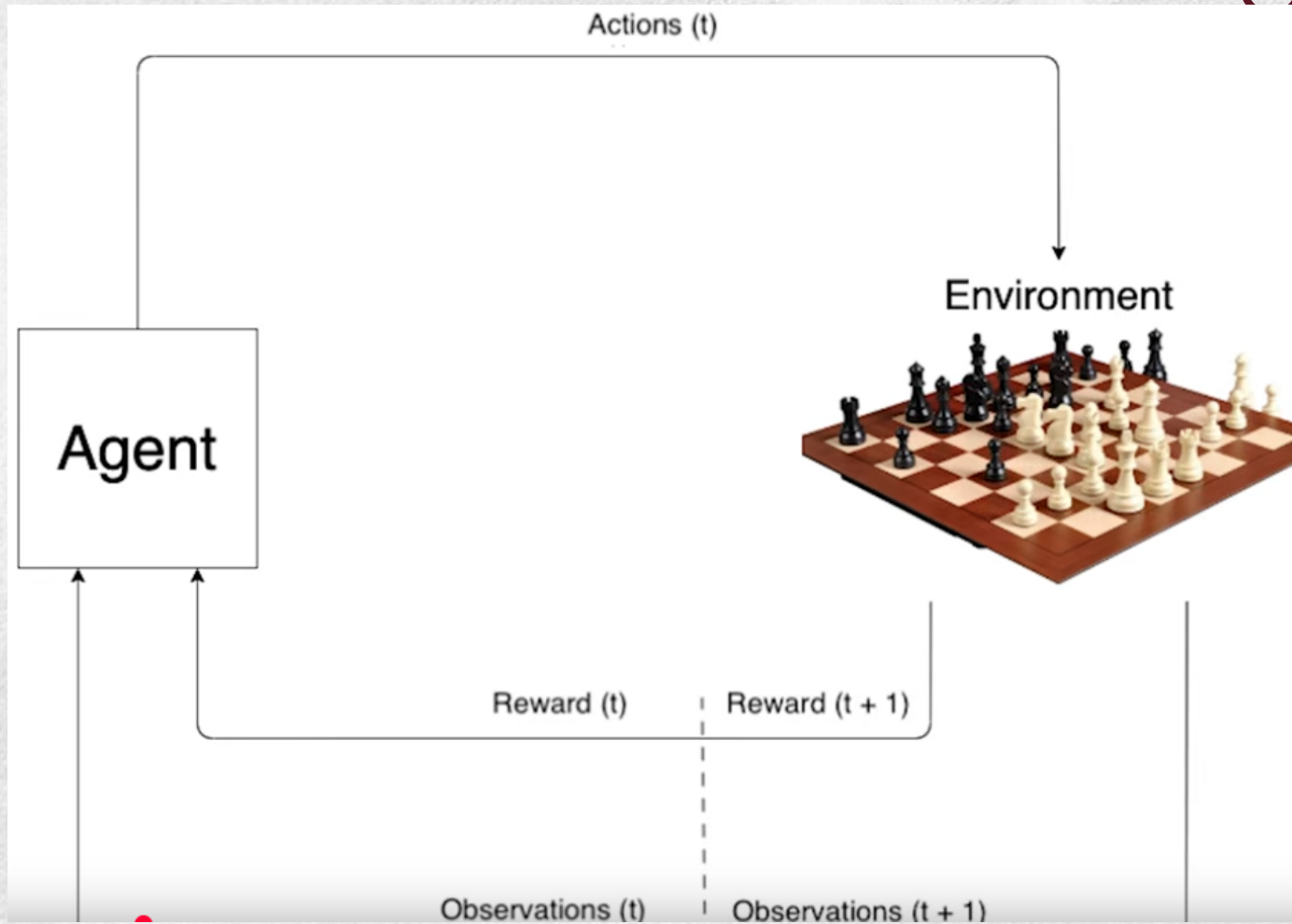- Encryption
- Compression

Data
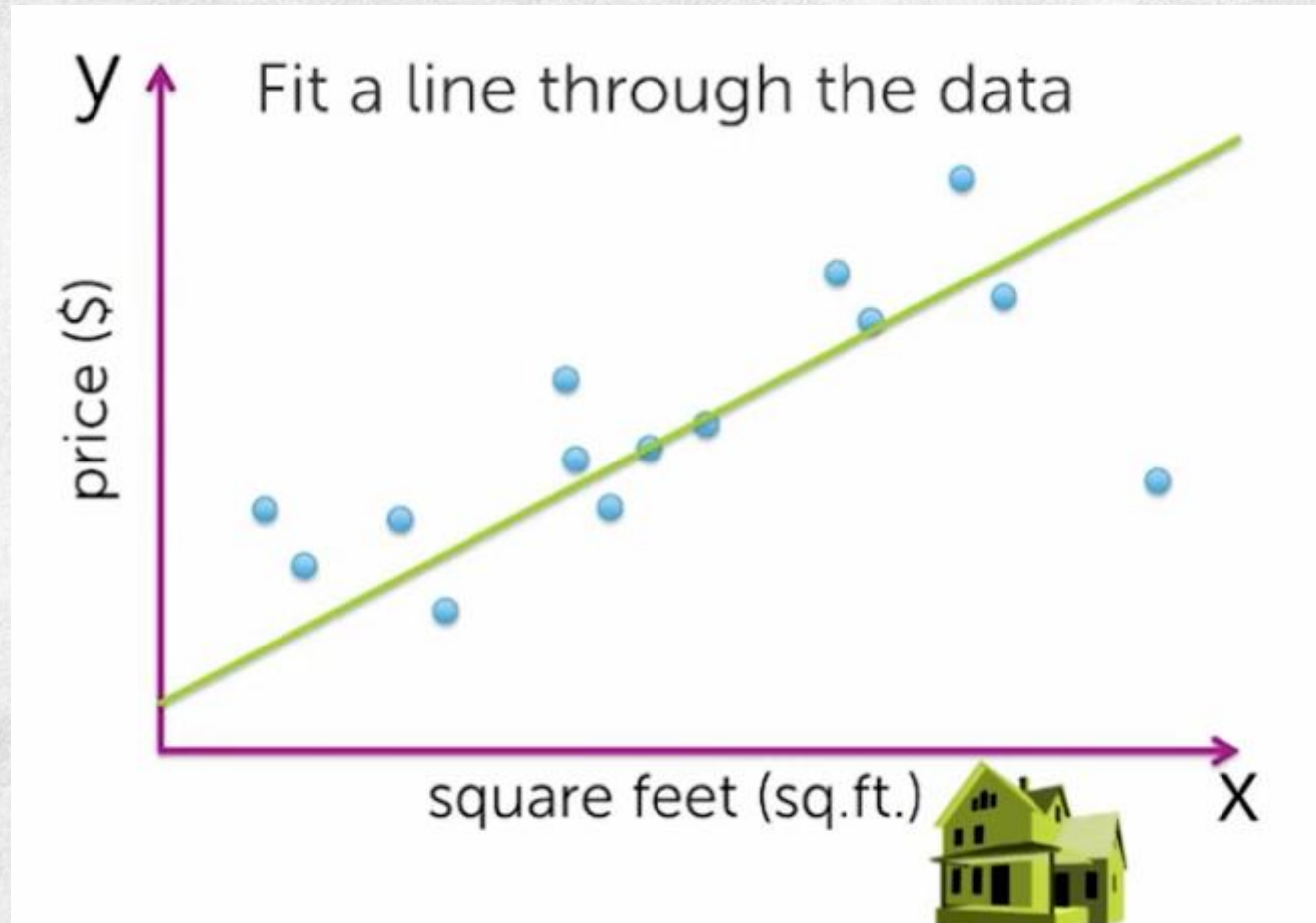
Supervised Learning

Unsupervised Learning

Reinforcement Learning

Linear Regression

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Linear Regression

INPUT, FEATURE, INDEPENDENT VARIABLE

OUTPUT, TARGET, DEPENDENT VARIABLE

VARIABLE 1 → MODEL → VARIABLE 2

EX: LINEAR REGRESSION:

Constant/Intercept   Independent Variable

$$Y_i = \beta_0 + \beta_1 X_i$$

Dependent Variable   Slope/Coefficient

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