Introduction

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Welcome!

1 Basic Concept

1.1 Types of Learning

- **supervised learning**: data in training set contain expected outcomes(known as **labels**)
- **unsupervised learning**: data in training set don't contain labels
- **reinforcement learning**: only have **reward**

1.2 Classification vs Regression

- **regression**: when target variable is **continuous**
- **classification**: when target variable is **discrete**

2 Format of ML

- Input(features): denoted by $x^{(i)}$, where i is index, not exponent
- Output(target): denoted by $y^{(i)}$, this is what we need to predict
- Training example: a pair of input and output $(x^{(i)}, y^{(i)})$, note that x, y and θ can all be vectors
- Training set: a list of training example, let's say it has length of m: $\{(x^{(i)}, y^{(i)}); i \in [1, m]\}$
- Space notation: use $\mathcal{X}$ and $\mathcal{Y}$ to represent space of input and output
- Hypothesis: a function $h : \mathcal{X} \mapsto \mathcal{Y}$, so that $h(\cdot)$ can predict y given x Function h can be obtained by putting training set into learning algorithm