What is Machine Learning (ML)

Prediction of outcome conditional on information

- Given: current temperature, humidity, dew point, etc
  - Predict: whether it will rain in next hour
- Given: past 20 days of stock returns, earnings, industry, etc.
  - Predict: next day return

Not guessing ?

Prediction should be better than random guess.

- Informed by the data on which the prediction is conditioned
- Emphasis on generalization
    - Good prediction of data never seen before (out of sample)
    - Versus *explaining* in-sample data
        - Not memorization

It is a **process**, not a collection of algorithms !

- A methodical process to create the best prediction
- We will teach the "Recipe" for Machine Learning _ Scientific method rather than applying an API

ML and Finance, rather than ML for Finance

Machine Learning is a skill applied to many domains, not just Finance

- Transferable skill set
- Innovation originates outside and migrates to Finance
- Finance: historically numeric data
    - Wide opportunity set (for Finance) in non-numeric data (Images, Text) which we will study
- We will learn ML with Finance as examples

Our viewpoint

- ML is an *experimental* science
    - scientific method for problem solving
    - combine engineering *and* math
- We will jump-start your experimentation: Engineering first, then math
    - Early lectures a "sprint" to get you programming and experimenting
    - Will revisit we greater mathematical basis
- Teach ML with example data that is numeric, image, and text

  - Forward looking: the future of Finance will have lots of non-numeric data