What is Machine Learning (ML)

- Prediction
    - What will the weather be like in the next hour: sun, clouds, rain
    - Will a stock outperform the market
    - How much will a stock outperform ?

Informed Prediction conditioned on information versus guessing

- What will the weather be like in the next hour ?
    - Guess: Three cases, predict each case with equal probability
    - Informed. Condition on
        - Weather now
        - Humidity
        - Season

- Will a stock outperform/underperform ?
    - Guessing: Two cases, guess each with 50% probability
    - Informed. Given the following attributes
        - Recent past performance
        - Earnings
        - Industry

Types of prediction

- Classification: predictions come from a discrete set of values
    - Will a stock outperform or underperform the market
- Regression: predictions come from a continuous set of values
    - *How much* Will a stock outperform

Emphasis on *generalization*

- Good prediction on data never seen before (out of sample)
- Versus *explaining* in-sample data
    - Not memorization

How this course is different

Process versus algorithms

Machine Learning 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

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

Emphasis on non-traditional (for Finance) data

Non-numeric data too !

- Finance traditionally based on numeric and structured data
- Alternative data
    - Image
    - Text

We believe the future of Finance will evolve to much heavier use of unstructured data, especially non-numeric

- Images: Video, satellite
    - Forecast earnings (and hence performance) based on
        - Number of cars in parking lot
        - Activity of supply chain (number of shipments or components)

- Text/speech
    - Was the sentiment of a news article about the company Positive or Negative
    - Did the tone of the CFO's conference call reveal lack of conviction ?

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

In [2]:
```
print("Done")
```

```
Done
```