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February 3, 2020

1 Week 1

- Plan
  - Motivate Machine Learning
  - Introduce notation used throughout course
  - Plan for initial lectures
    - *What*: Introduce, motivate a model
    - *How*: How to use a model: function signature, code (API)
    - *Why*: Mathematical basis – enhance understanding and ability to improve results
- Course Overview
- Getting Started
- Machine Learning: Overview
- Intro to Classical ML

2 Week 2

- Plan
  - Introduce a model for the Regression task: Linear Regression
  - Introduce the Recipe for Machine Learning: detailed steps to problem solving
- Recap: Intro to Classical ML
- Our first model: Linear Regression (Overview)
- A *process* for Machine Learning
  - Go through the methodical, multi-step process
    - Quick first pass, followed by Deeper Dives
  - This will be a code-heavy notebook !
  - Illustrate Pandas, Jupyter, etc
  - Recipe for Machine Learning: Overview
    - Linked notebook
- The Loss function for Linear Regression
  - Linear Regression: Loss Function
- Deeper dives
  - Iterative improvement

    - When to stop: Bias and Variance
        - Regularization
- Prepare Data step
    - Fitting a transformation on training data
    - Applying to training, validation, test
    - Prepare Data: deeper dive
- Prepare data 2: Tranformation Pipelines
    - Applying transformations consistently
    - Key properties to adhere to
    - `sklearn` Pipelines
    - Transformation pipelines
- Fine tuning techniques