Foundations of Machine Learning

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Lab 0: Black box machine learning

Machine learning

Learning Objectives

1. What is machine learning for?
2. What is machine learning?
3. How do we frame a machine learning problem?
4. How do we evaluate machine learning models?
5. What can go wrong?

Concept Check Questions

1. Give 3 examples of ML applications, and name what type of ML problem it is (e.g. binary classification, regression, etc).
2. What is supervised machine learning?
3. What is feature extraction?
4. What are the inputs of a loss function?
5. Is a small loss or a large loss preferable?
6. Write down a loss function for classification and a loss function for regression.
7. Describe overfitting in 1 sentence.
8. What is a hyper parameter? Name two examples of hyperparameters.
9. What is the difference between a validation set and a test set? Why would the performance on the two sets differ?

10. Briefly explain how to perform k-fold cross-validation.

11. Briefly explain each of the following:

    - Information leakage
    - Sample bias
    - Covariate drift
    - Concept drift