

CMSC 422 Introduction to Machine Learning Lecture 11 Review and Practice Problems

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Decision Trees

- > What is a decision tree, and how to induce it from data
- Fundamental Machine Learning Concepts
 - Difference between memorization and generalization
 - What inductive bias is, and what is its role in learning.
 - What underfitting and overfitting means
 - How to take a task and cast it as a learning problem

Why you should never ever touch your test data!!



- New Algorithms
 - K-NN classification
 - K-means clustering
- Fundamental ML concepts
 - How to draw decision boundaries
 - What decision boundaries tells us about the underlying classifiers
 - The difference between supervised and unsupervised learning



Perceptron concepts

- training/prediction algorithms (standard, voting, averaged)
- convergence theorem and what practical guarantees it gives us
- how to draw/describe the decision boundary of a perceptron classifier

Fundamental ML concepts

- Determine whether a data set is linearly separable and define its margin
- Error driven algorithms, online vs. batch algorithms



- > What are reductions and why they are useful
- Implement, analyze and prove error bounds of algorithms for
 - Weighted binary classification
 - Multiclass classification (OVA, AVA)





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