What you should know

- **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!!
What you should know

- **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
What you should know

- 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 you should know

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