Learning from Observations

Chapter 18 -4

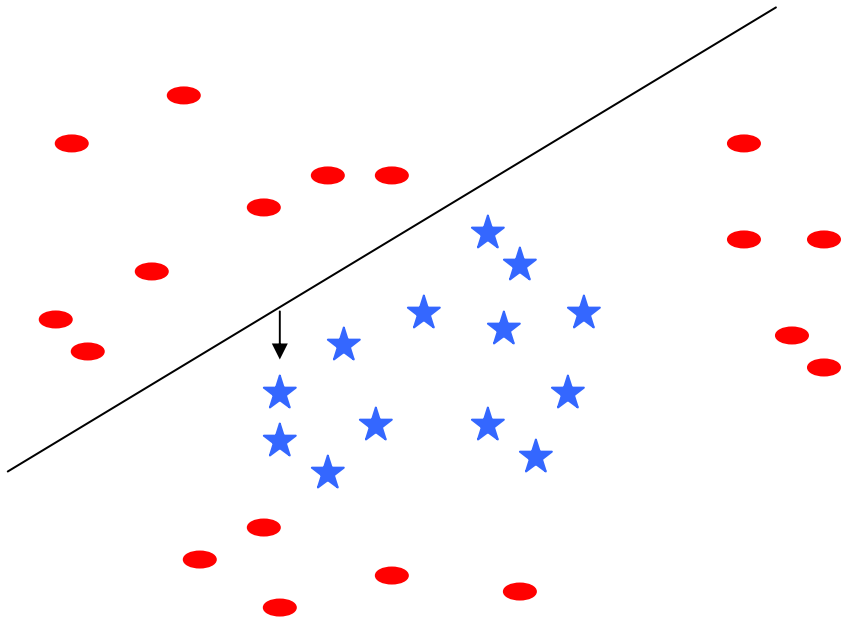
With material borrowed from
http://aima.cs.berkeley.edu/

Ensemble Learning

- Which of the two options increases your chance to have a better grade on the exam?
  - Solving the test individually
  - Solving the test in groups
- Why?

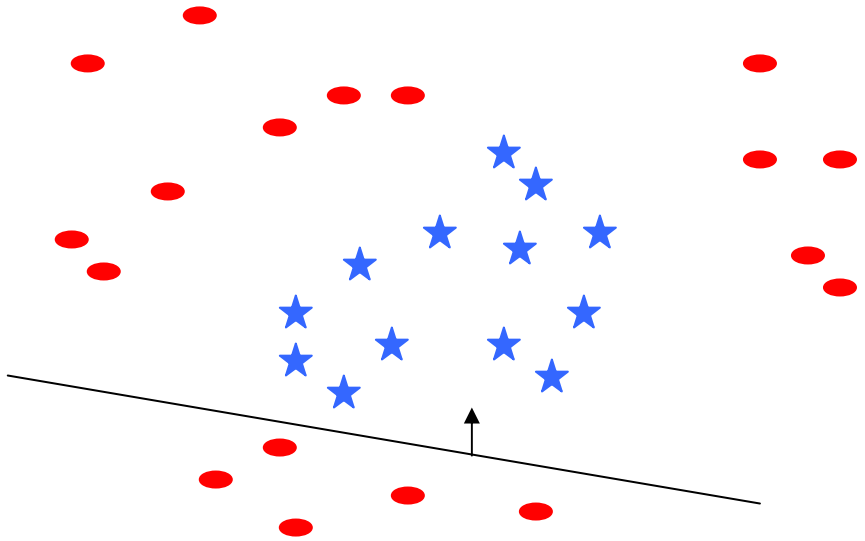
Ensemble Learning

- Weak classifier A



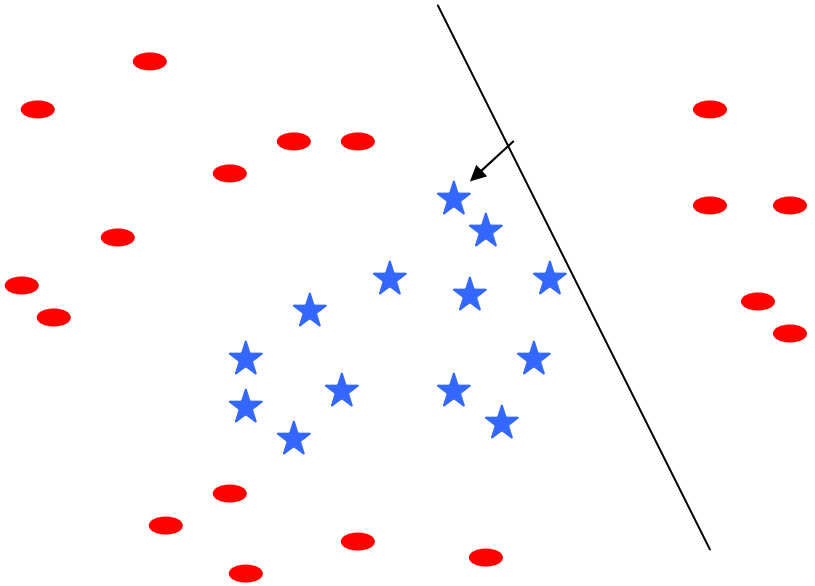
Ensemble Learning

- Weak classifier B



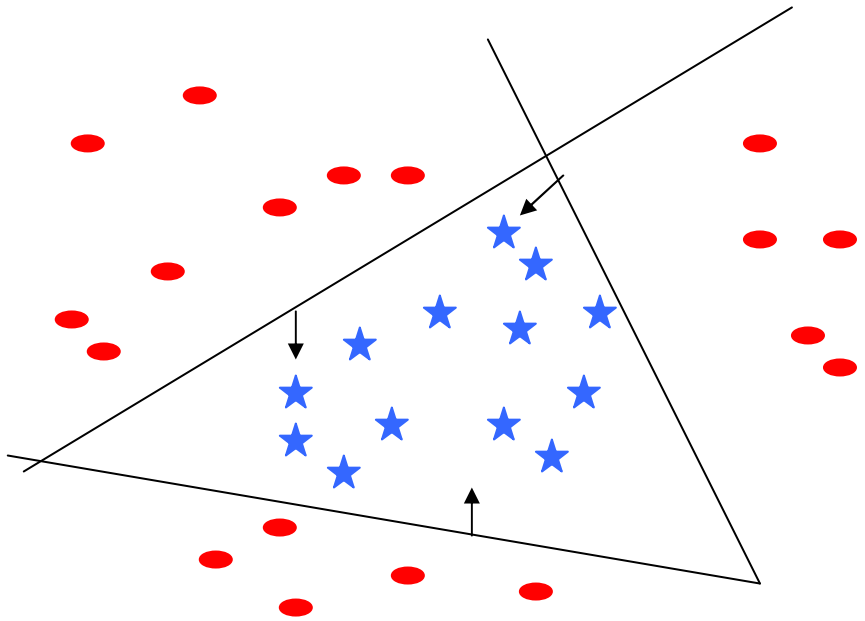
Ensemble Learning

- Weak classifier C



Ensemble Learning

- Ensemble of A, B, and C



Ensemble Learning

- For an ensemble to work the following conditions must be true:
  - The errors of the classifiers need not to be strongly correlated
  - The errors of the individual classifiers making up the example need to be less than 0.5 (at least better than chance)

Ensemble Learning

- Key issues
  - How many hypotheses to produce
  - How to combine them to predict
    - Majority vote
    - Sum of Weighted votes
- Some examples to generate many hypotheses
  - Random forest
  - Boosting Fig. 18.9
  - Bagging