

# Multiclass Classification

# One-vs-all approach

- E.g. suppose we have three class labels 1, 2, 3.
- Train three classifiers,
  - 1 vs 2,3
  - 2 vs 1,3
  - 3 vs 1,2
- When a new instance comes to be classified, run each classifier and pick the prediction with the highest probability.
- Applicable when a probability or score is produced.

# DAG approach

- **DAG approach**
  - E.g. **3-class classification**
  - First node is a classifier making the binary decision, **label 1 versus label 3**, say.
  - Depending on the outcome of this decision, the next steps are the decisions **1 versus 2** or **2 versus 3**.

