Outline

- Introduction

- Classification

- Frequent patterns

- Clustering

Introduction

- What is data mining
- What is machine learning
- What is artificial intelligence

Introduction

- Data
  - Data types
  - Data statistics
- Data preprocessing
  - Data cleaning
  - Data transforming
  - Data integrating

classification

- What is classification?
  - Supervised learning
  - Steps
- Algorithms
  - Decision tree-ID3,C4.5,CART
  - SVM
  - Bayes
  - ANN
- Model evaluation and selection
  - Confusion matrix and criteria
  - Cross-evaluation
- Ensemble methods
  - Bagging
  - Boosting
  - Random Forest

Frequent patterns

- What is a frequent pattern
    - Association rule
- Algorithm
    - Apriori
    - FP-growth

Clustering

- What is clustering
  - Unsupervised learning
- Algorithms
  - Partition-based—k-means
  - Hierarchical-based—two ways
  - Density-based—DBSCAN
  - AP (2007, Science)
  - Local density-based (2014, Science)

Graph clustering

- What is graph clustering
  - Complex network
  - Graph clustering
  - Community
  - Module
- Algorithms
  - CPM
  - Spectral clustering
  - GN and Q
  - MCL

Thank you!