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Introduction

What is Data Mining?

Data Mining ~ Big Data ~ Predictive Analytics ~ Data Science ~ Machine Learning

Data mining = extraction of actionable information from very large datasets.

This class

High dim. data

LSH

Clustering

reduce Dimension

Graph data

Pagerank

Graph Neural Networks

Spam Detection

Infinite data

Filtering data streams

Queries on streams

Machine learning

Decision Trees

Learning Embeddings

Apps

Recommender systems

Duplicate document detection

Mapreduce

: Early distributed Computing Programming Model

implementations: spark, hadoop...

procedure:

Map: output key-value pairs.

Sort and Collect:

sort pairs by key, output key-(list of values) pairs;

Why shuffle?: Avoid some reducers have too much workload.

Reduce output answers

Spark

: Extends Mapreduce

Additions to Mapreduce Model: Fast data sharing:

cache

no disk-stored

Richer functions in map and reduce

Compare Hadoop.Mapreduce and Spark

generally Spark is faster, needing more memory.

Spark is easier to use.

Mapreduce is great for:

sequential data access

large batch jobs(not interactive, real-time)