# graphdb gveGraph Databases

Graph databases are databases where stored data is represented as a graph. A graph contains nodes which are organized by relationships. Each node and relationship can have properties for storing unstructured information.

In comparison, a relational database management system (RDBMS) represent data as columns in tables and relationships are implemented via foreign keys. To navigate upon foreign-keys, join operations are required. A join operation is a cost-intensive operation because the RDBMS has to match two columns in order to properly link two columns.

A graph database is a NoSQL database which is specialized for highly connected information, like social media (social graph), online retailer (customers who bought this item also bought), etc. Navigating relationships does not require any special operations as relationships are first class member of a graph database. No joins are required.

Where relational algebra are the mathematical foundations of RDBMS, graph theory are the foundations of a graph database. This allows graph databases to fully integrate and optimized graph algorithms like the shortest path, spanning tree and Dijkstra algorithm.

## Neo4j

For our evaluations and test, we used the graph database neo4j, running on java. Neo4j is an implementation of a graph database used already by big companies like Ebay, HP, Cisco, Walmart, etc.

Neo4j provides an easy to use query language, called Cypher. Neo4j stores relationships

## Cypher