

Wrap-Up

Summary: Why Use a DBMS?

- DBMS: serving large data sets to large, heterogeneous user groups

- Quality of service

- (optimized) query language = fast & flexible access to large data assets
- Concurrent access
- Data independence

- Efficiency

- scalability; reduced application development time

- Information integration

- Uniform data administration; concise information modelling

- Safety

- Data integrity & security; Crash recovery

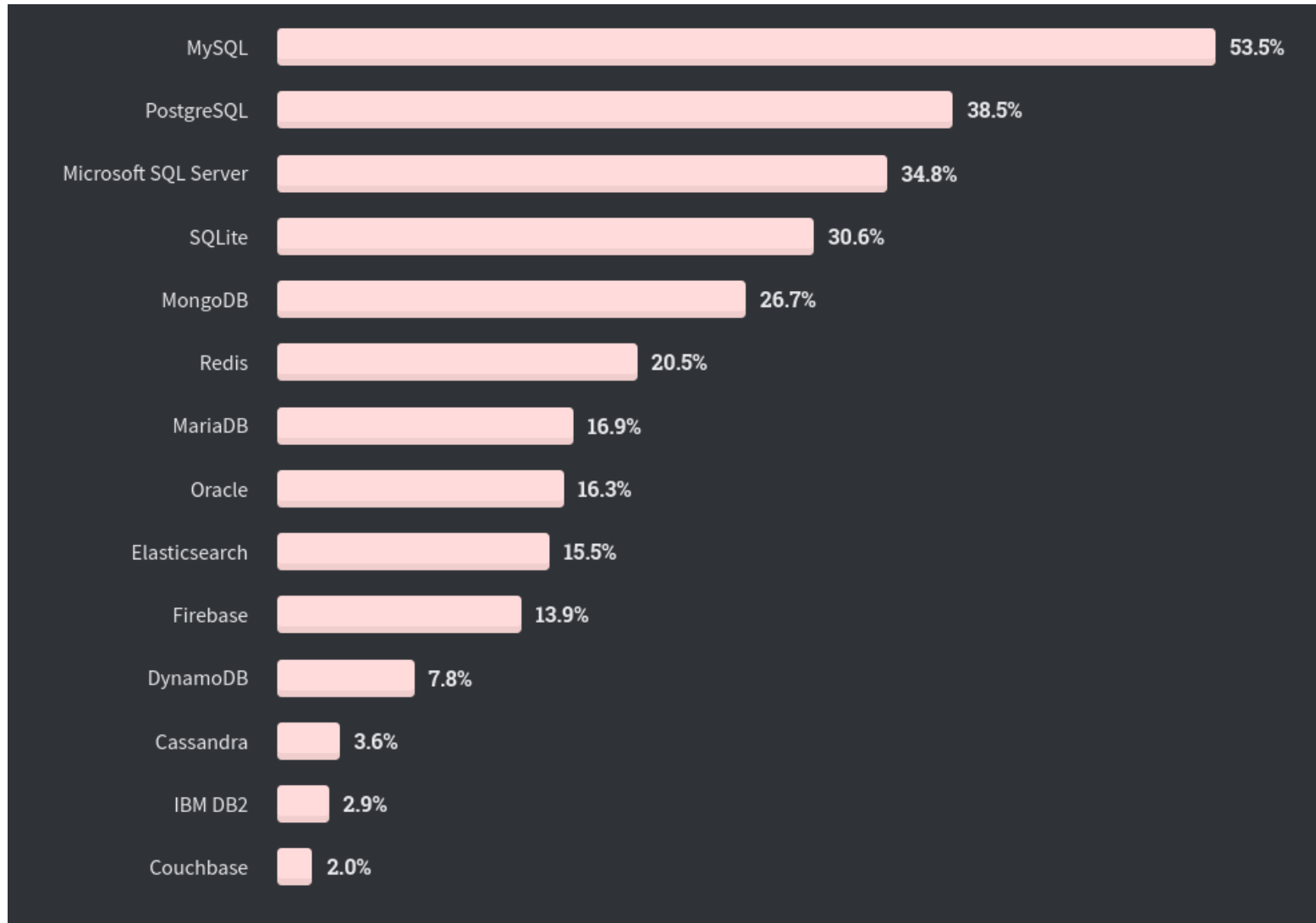
Big Data

DB Ranking by Deployments, db-engines.com

426 systems in ranking, November 2025

Rank			DBMS	Database Model	Score		
Nov 2025	Oct 2025	Nov 2024			Nov 2025	Oct 2025	Nov 2024
1.	1.	1.	Oracle	Relational, Multi-model ⓘ	1239.78	+27.01	-77.23
2.	2.	2.	MySQL	Relational, Multi-model ⓘ	865.82	-13.84	-151.98
3.	3.	3.	Microsoft SQL Server	Relational, Multi-model ⓘ	718.87	+3.82	-80.94
4.	4.	4.	PostgreSQL	Relational, Multi-model ⓘ	651.36	+8.16	-2.97
5.	5.	5.	MongoDB +	Multi-model ⓘ	371.68	+3.66	-29.25
6.	6.	↑ 7.	Snowflake	Relational	197.84	-0.81	+55.35
7.	7.	↓ 6.	Redis	Key-value, Multi-model ⓘ	145.09	+2.76	-3.55
8.	8.	↑ 14.	Databricks	Multi-model ⓘ	131.50	+2.70	+45.04
9.	9.	9.	IBM Db2	Relational, Multi-model ⓘ	119.28	-3.10	-2.47
10.	10.	↓ 8.	Elasticsearch	Multi-model ⓘ	113.97	-2.69	-17.67

DB Ranking by Dev'ers, Stackoverflow



[illegible]

„No One Size Fits All“

- General insight today: **no singular data modeling paradigm** (eg, sets) can match all requirements in semantics & performance
- Ex: SAP HANA: four main-memory storage engines
 - column-store, for OLAP-dominant & mixed workloads
 - row-store, for OLTP-dominant workloads
 - graph engine
 - text engine

■ Refs:

- M. Stonebraker et al. *"One size fits all": an idea whose time has come and gone*. ICDE, 2005
- F. Färber et al.: *The SAP HANA Database – An Architecture Overview*. IEEE Data Eng. Bull., 35(1):28–33, 2012
- V. Sikka et al. *Efficient transaction processing in SAP HANA database: the end of a column store myth*. SIGMOD, 2012



<http://martinfowler.com/bliki/PolyglotPersistence.html>

Course Plot – or: why did I take it?

- How to design databases, and how to search them
- How to design (Internet) services
- Database services revisited
- Practice: set up a Web service
 - LAMP = Linux, Apache, MySQL, PHP

What industry expects a CS graduate to know

Your entry point to the DB [admin] world

Check also database videos, such as [this one](#)

Must-Haves for IT Job Interviews

- "47% of the job ads analyzed expect **economics knowledge**. Also, **communication skills** are emphasized.
 - Currently **database skills** are at the top of the IT companies' wish list, every 3rd IT job ad requires them. Further, Business Intelligence, Enterprise Resource Planning, and Service-Oriented Architectures are an asset. Additionally, relevant hands-on experience, e.g., in project work, plays an important role."
- Thomas Reher, Executive Board member, PPI AG

But, Mind You:

- Chances are you won't use classroom knowledge as is
 - Diversity of technology, requirements, enterprise setups...
- ...then why did we do it?
 - Grasp the concepts
 - What is the SQL language and what you need to know (at least basics)
 - Rapidly changing database services technology
- PS: info.cwi.nl/~wim/infocom

Best Success!

