

Data Modelling & Databases

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“A curry can be written in many different ways”

- Prof. Dr. Gustavo Alonso, 2026

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Summary of the Script and Lectures

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1 Introduction

A note on the quote on the title page: He did not *actually* mean “curry”, but of course “query”, but he just pronounced it that way.

This summary assumes some basic knowledge about databases. All words written in **bold** should be clickable and should link you to the corresponding term in the glossary. If I did not forget a term that is, of course.

2 SQL

SQL is a **declarative** programming language, used to describe and operate on databases.

Keyword	Description
SELECT val, val2	returns the columns val and val2
FROM table d, table2 c	selects the target tables. Can use range variables (d, c here)
WHERE	Filter results. Can also target non-acquired columns
DISTINCT	Returns elements without duplicates
IN	Checks if the element is present in subquery
UNION	Set union (also removes duplicates)
INTERSECT	Set intersection
EXCEPT	Set difference
JOIN	Join tables, always requires a ON clause
ON	Specify on which column with what condition to join the tables
DATE	Used to do comparisons against fixed Dates (followed by Datestring)
AS	Rename a column
AVG(column)	Computes the average of the specified column
SUM(column)	Computes the sum of the specified column

We can directly add new columns to our result using statements like (also note that we do not actually return salary and employment columns)

```
SELECT name, salary * employment / 100 AS RealSalary FROM employees;
```

When applying GROUP BY, COUNT and the like operate on each group, not entire dataset.

NATURAL JOIN doesn't require a ON clause (it looks for columns with same name)

After GROUP BY we can't use WHERE, instead we can use HAVING, which operates on groups instead of on rows.

We can compare against a query with a single result column and row using a WHERE clause.

The CROSS JOIN is the both-sided extension to LEFT JOIN and RIGHT JOIN

We can compute the number of all passed grades for a person using something like

```
SUM(CASE Grade >= 1 THEN 1 ELSE 0 END) AS PassedSubjectsCount
```

Glossary

declarative Describes *what* to achieve, but not how.

imperative Describes how to achieve something.

SQL Structured Query Language.