T-SQL Data Manipulation Playbook

WORKING WITH THE
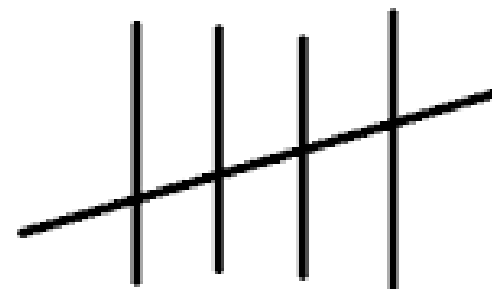## T-SQL DATA MANIPULATION LANGUAGE

Xavier Morera
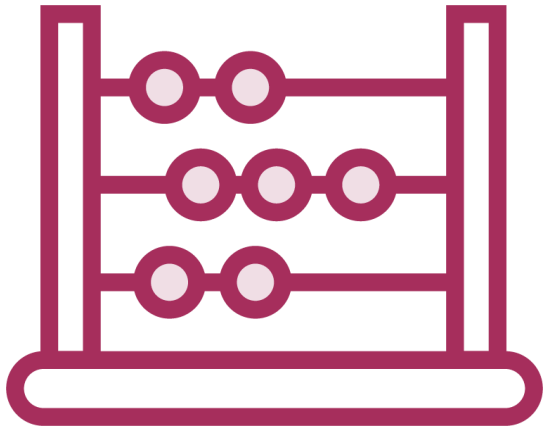HELPING DEVELOPERS UNDERSTAND SEARCH & BIG DATA

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Working with Data

Things That Help Us Work with Data
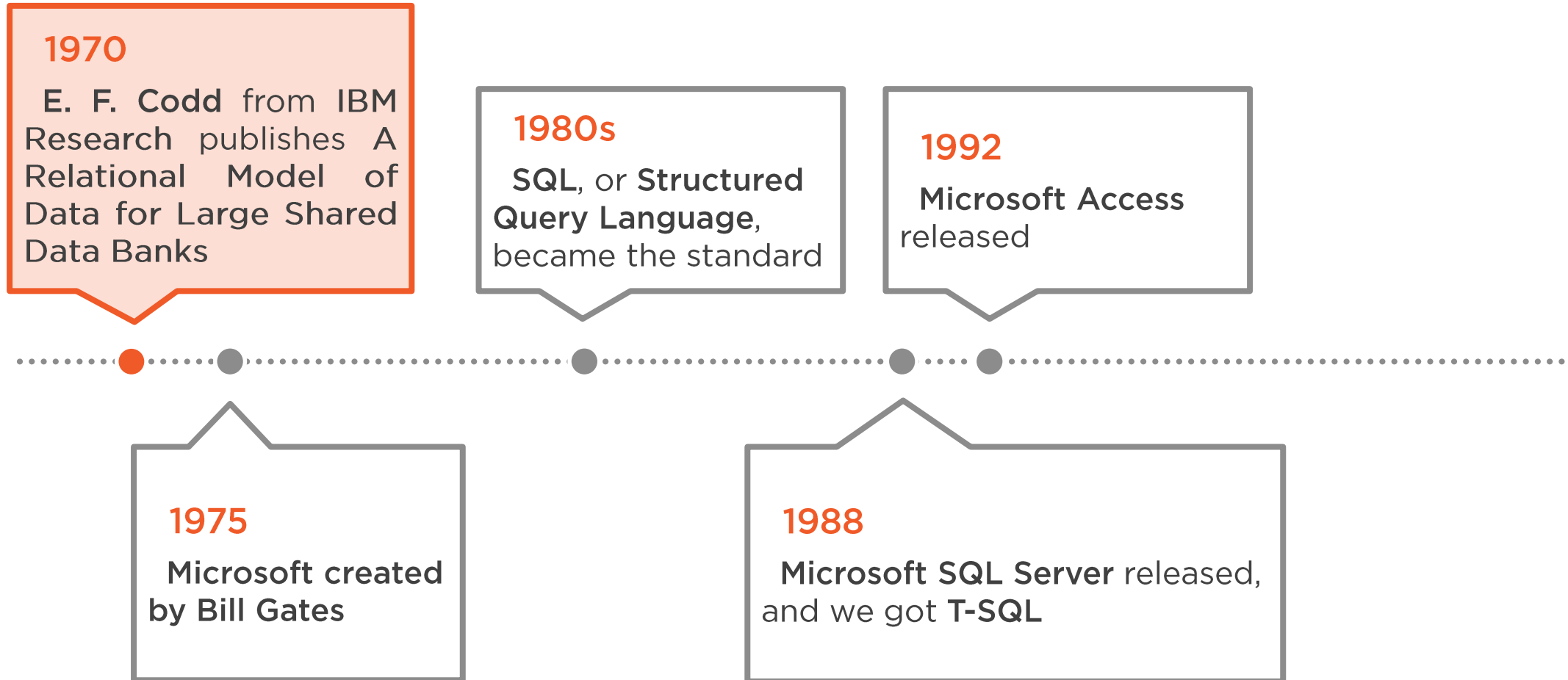
Counting and performing operations

Logging your data in writing

But at some point we need more

Timeline of Some Important Events

1970

E. F. Codd from IBM Research publishes A Relational Model of Data for Large Shared Data Banks

1980s

SQL, or **Structured Query Language**, became the standard

1992

Microsoft Access released

1975

Microsoft created by Bill Gates

1988

Microsoft SQL Server released, and we got **T-SQL**

Microsoft and Ashton-Tate announce Microsoft SQL Server, a relational database server software product for local area networks (LANs) based on a relational database management system licensed from Sybase.

January 16, 1988

Microsoft SQL Server Release History

Version	Year	Release name	Code name	Internal database version
1.0 (OS/2)	1989	SQL Server 1.0 (16-bit)	Filipi	-
1.1 (OS/2)	1990	SQL Server 1.1 (16-bit)	Pietro	-
4.2A (OS/2)	1992	SQL Server 4.2A (16-bit)	-	-
4.2B (OS/2)	1993	SQL Server 4.2B (16-bit)	-	-
4.21a (WinNT)	1993	SQL Server 4.21a	SQLNT	-
6.0	1995	SQL Server 6.0	SQL95	406
6.5	1996	SQL Server 6.5	Hydra	408
7.0	1998	SQL Server 7.0	Sphinx	515
-	1999	SQL Server 7.0 OLAPTools	Plato	-
8.0	2000	SQL Server 2000	Shiloh	539
8.0	2003	SQL Server 2000 64-bit Edition	Liberty	539
9.0	2005	SQL Server 2005	Yukon	611/612
10.0	2008	SQL Server 2008	Katmai	655
10.25	2010	Azure SQL database (initial release)	Cloud database or CloudDB	
10.50	2010	SQL Server 2008 R2	Kilimanjaro (aka KJ)	661
11.0	2012	SQL Server 2012	Denali	706
12.0	2014	SQL Server 2014	SQL14	782
13.0	2016	SQL Server 2016	SQL16	852
14.0	2017	SQL Server 2017	Helsinki	869
Not yet released	2019	SQL Server 2019 CTP	Seattle	895

	Old version		Older version, still supported		test version	Latest preview version

https://en.wikipedia.org/wiki/History_of_Microsoft_SQL_Server

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SQL

ANSI SQL

T-SQL

T-SQL

T-SQL

Different T-SQL Sub-languages

DML
(* TCL)

DQL

DDL

DCL

Different T-SQL Sub-languages

DML
(* TCL)

Data
Manipulation
Language

DQL

Data
Query
Language

DDL

Data
Definition
Language

DCL

Data
Control
Language

Data Manipulation Language

Add records to a table

Modify existing records in a table

Remove records from an table

Data Manipulation Language

INSERT

Add records to
a table

UPDATE

Modify existing
records in a table

DELETE

Remove records from
an table

The Database for This Training
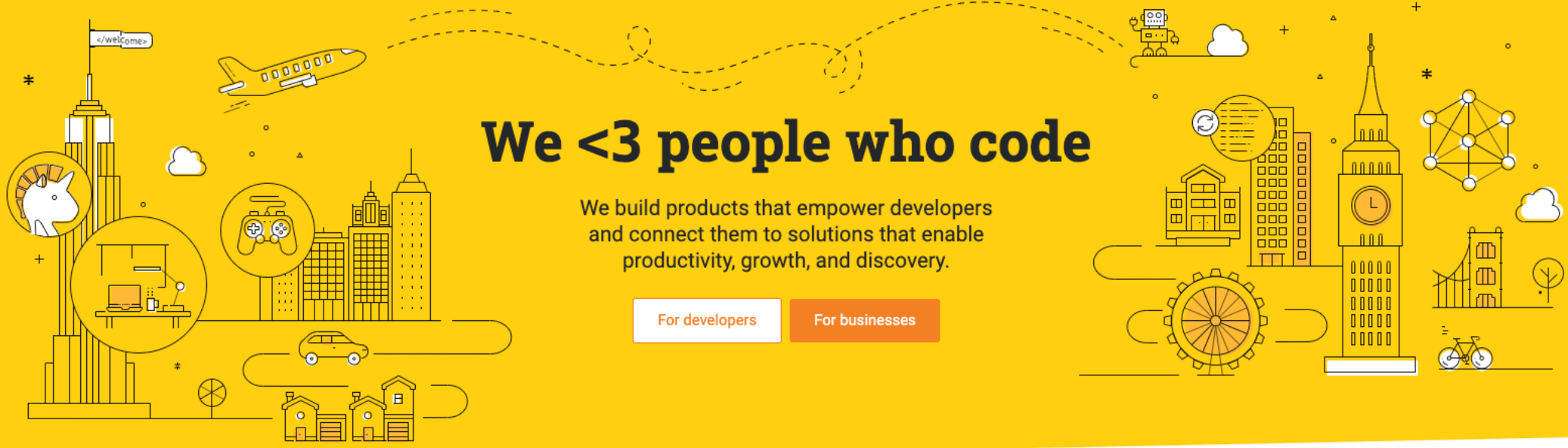
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Demo

Creating the Database for This Training

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SELECT (Transact-SQL)

10/23/2017 • 5 minutes to read • 👤👤👤👤👤

APPLIES TO: ✅ SQL Server   ✅ Azure SQL Database   ✅ Azure SQL Data Warehouse   ✅ Parallel Data Warehouse

Retrieves rows from the database and enables the selection of one or many rows or columns from one or many tables in SQL Server. The full syntax of the SELECT statement is complex, but the main clauses can be summarized as:

[WITH { [XMLNAMESPACES ,] [<common_table_expression>] }]

SELECT select_list [INTO new_table]

[FROM table_source] [WHERE search_condition]

[GROUP BY group_by_expression]

[HAVING search_condition]

[ORDER BY order_expression [ASC | DESC]]

The UNION, EXCEPT, and INTERSECT operators can be used between queries to combine or compare their results into one result set.

📄 Transact-SQL Syntax Conventions

Syntax

```
-- Syntax for SQL Server and Azure SQL Database
```

Copy

SELECT Syntax

SELECT select_list INTO new_table FROM table_source WHERE search_condition GROUP BY group_by_expression HAVING search_condition ORDER BY order_expression

SELECT Syntax

What is going to be selected

Used to copy data to new table

Where is the data coming from?

Filter records by a condition

SELECT select_list INTO new_table FROM table_source WHERE search_condition
GROUP BY group_by_expression HAVING search_condition ORDER BY order_expression

Group results, commonly used for performing aggregations

Specify search condition for a group or an aggregate.

Sort results by one or more columns

* UNION, EXCEPT, and INTERSECT

SELECT Syntax

SELECT select_list INTO new_table **FROM table_source WHERE search_condition**
GROUP BY group_by_expression HAVING search_condition ORDER BY order_expression

* UNION, EXCEPT, and INTERSECT

Demo

Using the SELECT Statement

Order	Clause	What it does
1	FROM	Specifies table, view, table variable source
2	ON	Specify a join condition
3	JOIN	Perform a join
4	WHERE	Filter rows
5	GROUP BY	Aggregate data
6	WITH CUBE or WITH ROLLUP	To work with multiple grouping sets
7	HAVING	Filter aggregated data
8	SELECT	Return selected columns
9	DISTINCT	Return only different values
10	ORDER BY	Sort final data
11	TOP	Limit amount of records

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WHERE (Transact-SQL)

08/08/2017 • 2 minutes to read • 👤👤👤👤👤

APPLIES TO: ✅ SQL Server ✅ Azure SQL Database ✅ Azure SQL Data Warehouse ✅ Parallel Data Warehouse

Specifies the search condition for the rows returned by the query.

📄 Transact-SQL Syntax Conventions

Syntax

```
[ WHERE <search_condition> ]
```
🗐 Copy

Arguments

< *search_condition* > Defines the condition to be met for the rows to be returned. There is no limit to the number of predicates that can be included in a search condition. For more information about search conditions and predicates, see Search Condition (Transact-SQL).

Examples

The following examples show how to use some common search conditions in the `WHERE` clause.

A. Finding a row by using a simple equality

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Comparison Operators Used in WHERE

EQUAL (=), UNEQUAL (!=, <>), and Range (<, >, <=, >=)

LIKE

EXISTS, IN, BETWEEN

ANY, SOME, ALL

Demo

Using the WHERE Clause

Takeaway

Different T-SQL sub-languages
- DQL
- DDL
- DCL

DML: Data Manipulation Language
- INSERT, UPDATE, and DELETE

Quick refresher
- SELECT
- WHERE