

# Sources of Query Performance Issues

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## Introduction



**What happens when you click “Execute”?**

**Store and retrieve data**

**Causes of performance woes**

- Strain on the server

**Indexes are your friends**

- Don't invalidate them

**Do you need all the columns?**

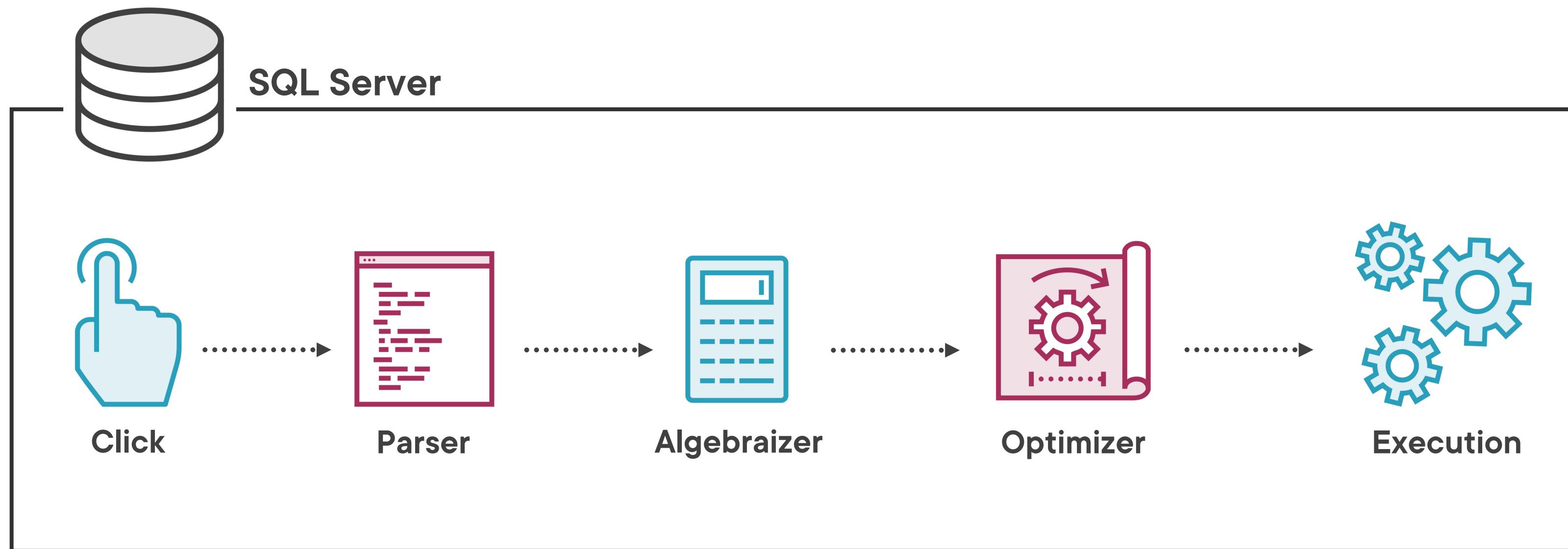


# Exploring SQL Server Internals

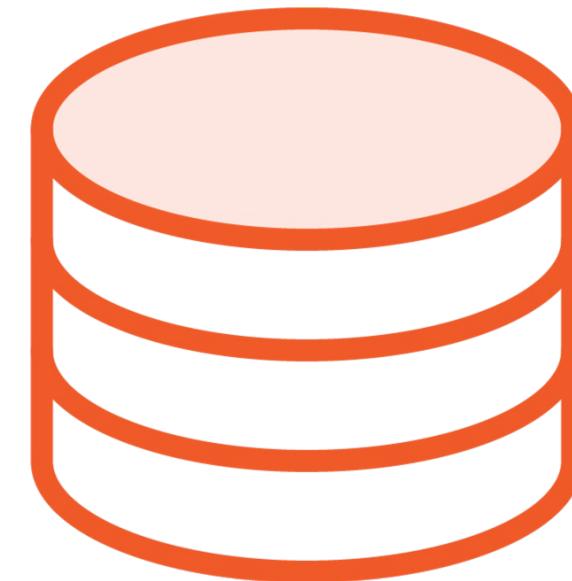
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# Clicking the Execute Button



# Data Storage and Retrieval



# Data Storage and Retrieval



**SQL places pages in cache**  
**Faster second execution**  
**They remain there until space runs out**  
**Oldest ones leave first**  
**More pages mean more work**



# Return Fewer Pages



**Add a filter where you can**

- Predicate

**Evaluates to true, false, or unknown**

- Unknown refers to NULL

**Indexes limit pages returned**

**Do you need all the data?**





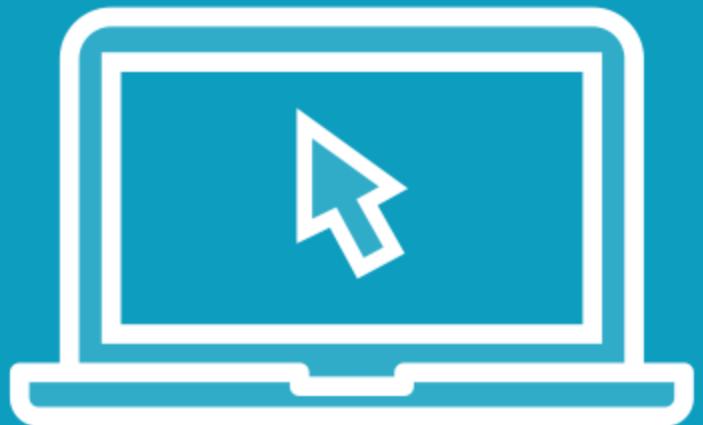
# **Informative Pluralsight Course**

## **SQL Server: Why Physical Database Design Matters**

Kimberly L. Tripp



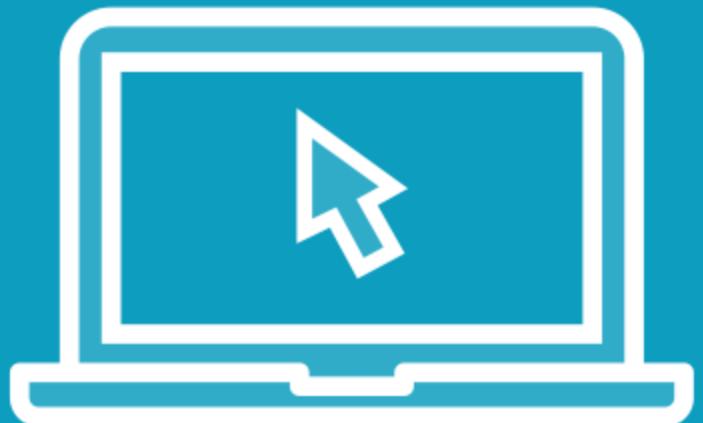
Demo



**How many pages make up your table?**



Demo



**Return less data with a filter**

**Are sorts slowing your queries down?**



# Indexes Drive Performance

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# Index

**An index is an on-disk structure associated with a table or view that speeds retrieval of rows from the table or view.**





**Nonclustered index**

**Smaller, ordered copy of the table**

**Unfiltered index**

- Contain all the rows

**Scan all the tables pages**

**Search and sorting combined**





**Don't invalidate index seeks**

**Seeks go directly to the record**

**Scans are not bad**

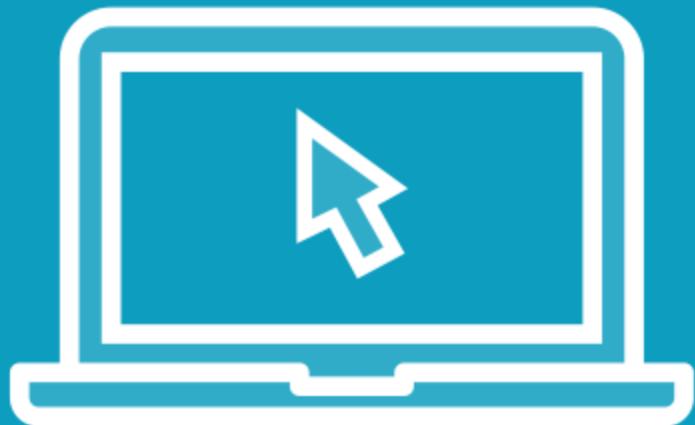
**Function in the WHERE clause**

**Using a LIKE operator**

- WHERE LastName LIKE '%Smith%'**



## Demo



**When functions in the WHERE clause slow you down**

**What type of LIKE operators to avoid**





**Do you really need all the columns?**

**Nothing wrong with SELECT \***

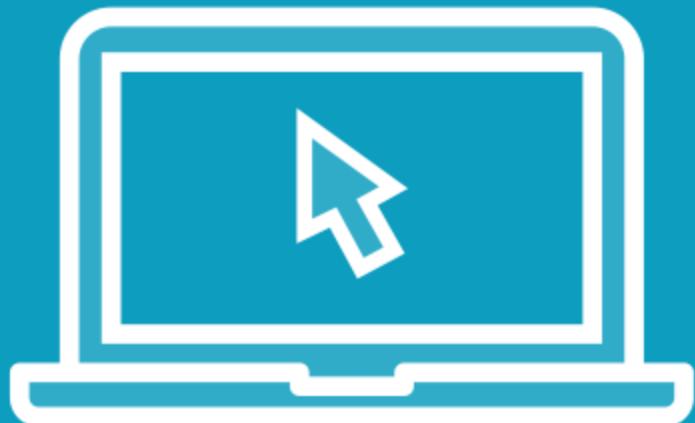
**Extra columns create more work for SQL**

**Stored off-row**

**Mindful of the extra-large columns**



Demo



**SELECT \* versus named columns**

**Try to limit the columns**



## Summary



**Phases a query goes through**

**Return fewer pages**

**Indexes allow queries to run faster**

- Speed is a by-product

**Don't invalidate the index seek**

**Do you need all the columns?**

- Sometimes



Up Next:  
Performance Insights with SQL Server Tools

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