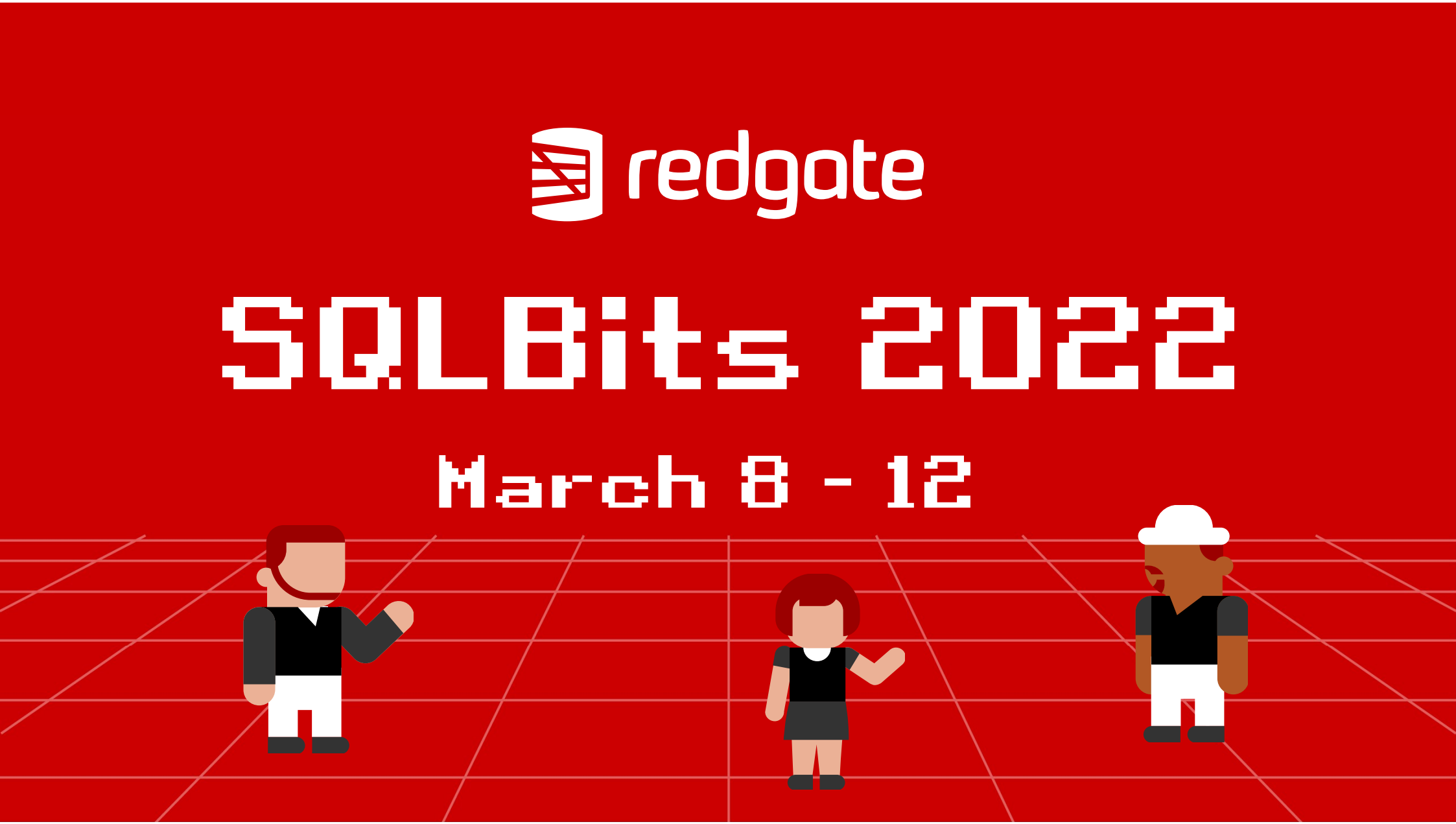
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SQLBits 2022
March 8 - 12

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Intelligent Query Processing

Kathi Kellenberger

Redgate Software

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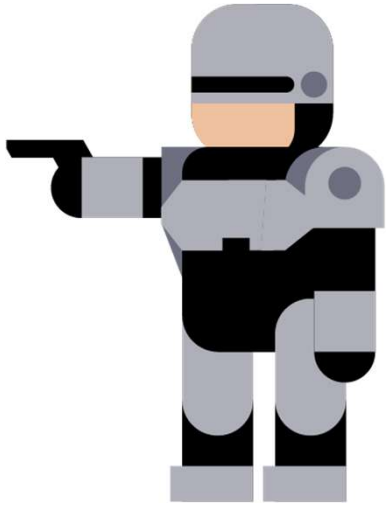


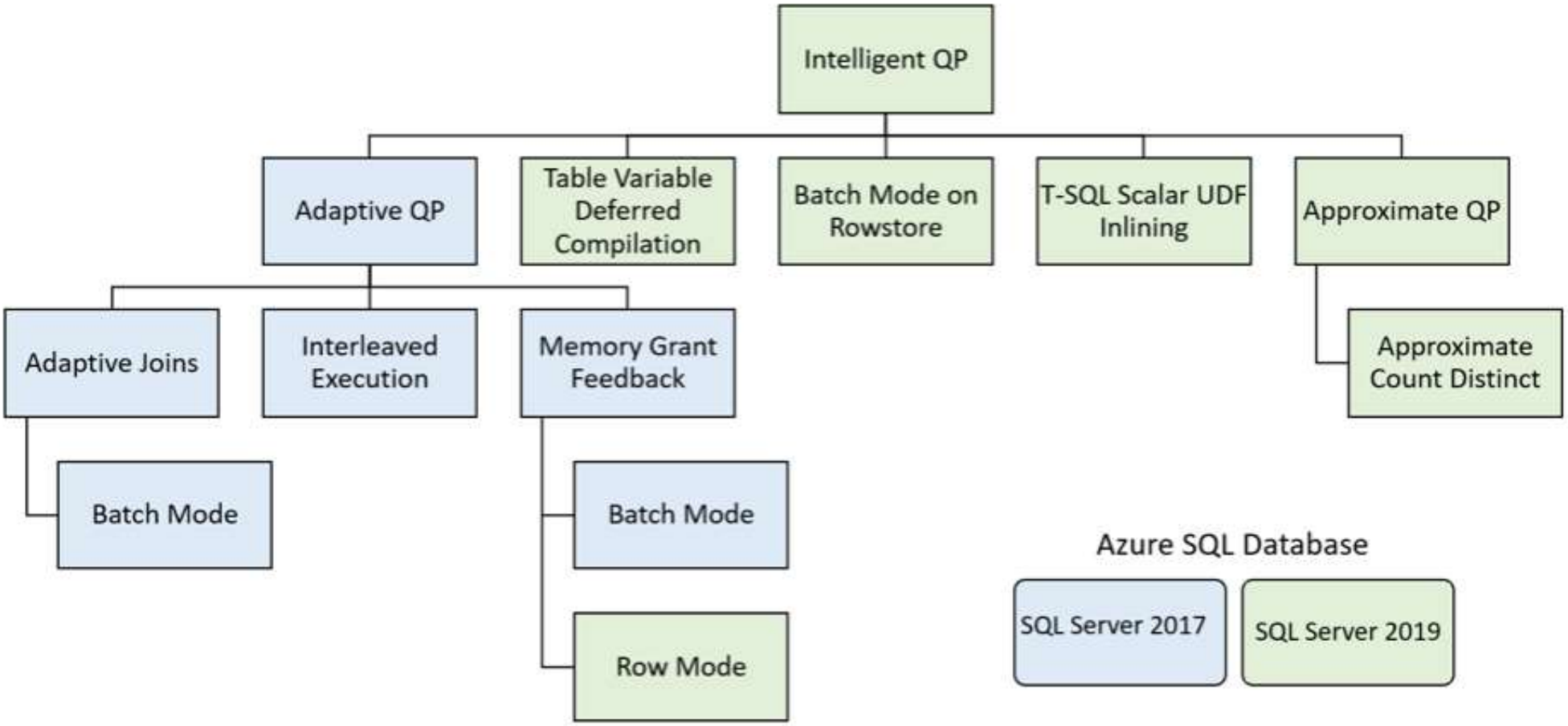
Kathi Kellenberger

Simple-Talk Editor at Redgate
Instructor at LaunchCode
Lifelong learner and teacher

MVP
Microsoft® Most Valuable Professional

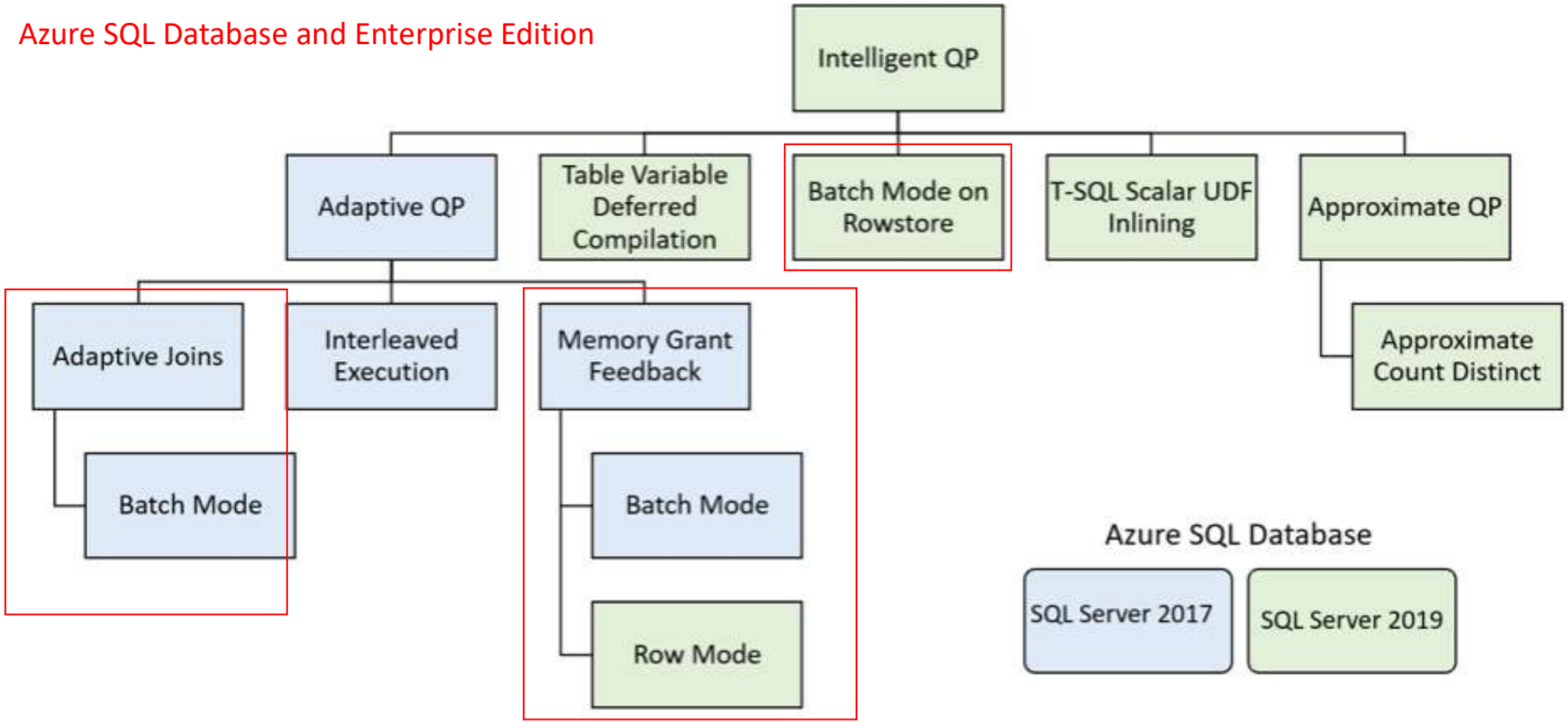
launch_code

redgate



https://docs.microsoft.com/en-us/sql/relational-databases/performance/intelligent-query-processing?view=sql-server-ver15

Azure SQL Database and Enterprise Edition



https://docs.microsoft.com/en-us/sql/relational-databases/performance/intelligent-query-processing?view=sql-server-ver15

Batch mode adaptive joins

- Automatic switching between hash join and nested loop
- Based on row count
- Requires a columnstore index
- Introduced in 2017
- Enterprise Edition only

Interleaved execution

- Captures cardinality of multi-statement table valued functions instead of 100
- Adjusts plan based on actual cardinality
- Introduced in 2019

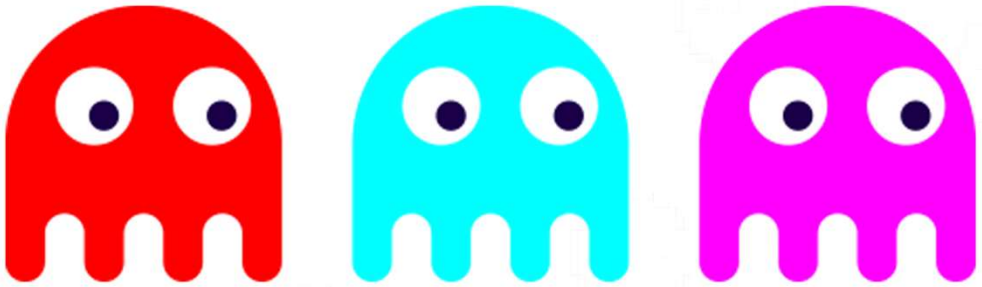


Table variable deferred compilation

- Bases estimation of row count on actual count of table variable instead of 1
- Plan adjusts based on actual row count
- Introduced in 2019

Scalar UDF inlining

- Code in UDFs refactored into a relational expression
- Doesn’t work for all UDFs
- Introduced in 2019

Batch mode on rowstore

- Calculate aggregates in batches instead of row-by-row for large results
- Decreases CPU requirements
- Introduced in 2019
- Requires Enterprise Edition

Memory grant feedback

- Recalculates actual memory required for a query
- Updates cached plan
- Decreases spills to disk
- Introduced in 2017 (batch mode) and 2019 (row mode)
- Requires Enterprise Edition

Approximate count distinct

- Use when speed is more important than accuracy
- Up to a 2% error rate
- Saves memory and less likely to spill to disk
- Introduced in 2019

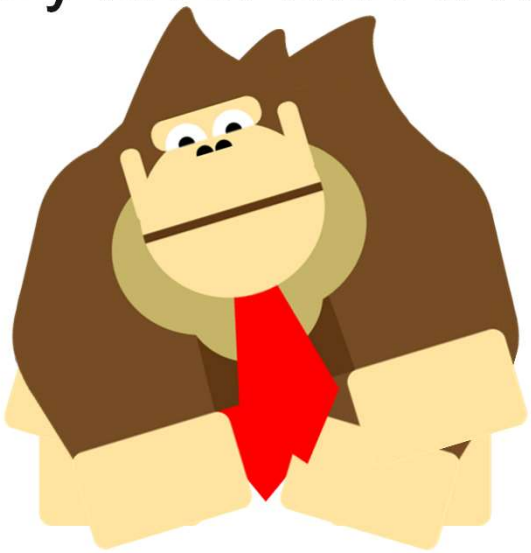
What's new in 2022?

- Parameter sensitive plan optimization
- Multiple plans against the same query
- See a demo: https://rd.gt/3oCrVs2

What's new in SQL Server 2022 (microsoft.com)

Options

- Database compatibility level controls availability of all functionality
- Database property to disable individual features
- Disable at query level with a hint



Resources

- Slides and demos: https://github.com/KathiKellenberger/ModernTSQL
- Greg Larsen articles: https://www.red-gate.com/simple-talk/author/greg-larsen/
- Bob Ward demo: https://www.youtube.com/watch?v=ncF-zFzBDAY

https://sqlb.it/?7131