

# SQLServerFast.com

## Execution Plan Video Training

Block 1: Understanding execution plans

Level: Basic

Chapter 7: Percentages in the execution plan

# Cost percentages

“Query cost (relative to the batch)”

Estimated cost of one execution plan compared to total cost of all plans

Batch of statements

Stored procedure

User-defined function

Trigger

Can be misleading!

Based on *estimated* cost of each execution plan

These estimates can be wrong

# Cost percentages

“Query cost (relative to the batch)”

Estimated cost of one execution plan compared to total cost of all plans  
Can be misleading!

Operator cost percentage

Estimated cost of one operator compared to total cost of plan  
Can be misleading!

Based on *estimated* cost of each execution plan  
These estimates can be wrong

  
`Index Seek (NonClus...  
[SalesOrderDetail] ...  
Cost: 45 %`

# Cost percentages

“Query cost (relative to the batch)”

Can help identify problem queries in batch or code unit

No more reliable than the cardinality estimates

Based on hardware assumptions that are ...

probably not true for your hardware and requirements ...

and mostly outdated

# Cost percentages

“Query cost (relative to the batch)”

Operator cost percentage

Can help identify problem queries in batch or code unit

No more reliable than the cardinality estimates

Based on hardware assumptions that are ...

probably not true for your hardware and requirements  
and mostly outdated

# Cost percentages

All cost percentages are *estimates*

Not an SSMS specific problem

Based on execution plan XML → Only estimated cost available

Other tools have the same data and display the same percentages

Exception: SentryOne Plan Explorer

Option to track actual resource usage while query is running

Used for “recosting”: attempt to approximate “actual operator cost”

Actual and estimated cost can be toggled in display

# Cost percentages

All cost percentages are *estimates*

Not an SSMS specific problem

Based on execution plan XML → Only estimated cost available

Other tools have the same data and display the same percentages

Exception: SentryOne Plan Explorer

Option to track actual resource usage while query is running

Not collected for queries that finish too fast

Actual costs display shows estimated costs in this case (like other tools)

# Cost percentages

All cost percentages are *estimates*

Not an SSMS specific problem

Based on execution plan XML → Only estimated cost available

Other tools have the same data and display the same percentages

Exception: SentryOne Plan Explorer

Option to track actual resource usage while query is running

Not collected for queries that finish too fast

Does not affect query cost relative to batch

Only operator cost relative to plan

# Completion percentages

## Live execution plan

Completion percentage for each operator

Number of rows produced so far vs. estimated number of rows to produce

Can go (far) over 100% if estimated number of rows is too low

May never reach 100% if estimated number of rows is too high

Progression not always linear

## Execution plan plus run-time statistics

Final numbers only

If not (near) 100%, estimated number of rows was wrong!

# Finding bad cardinality estimates

## Bad cardinality estimate

Often root cause of performance issue

Find by ...

Comparing *Actual Number of Rows* vs *Estimated Number of Rows*

Completion percentage in execution plan plus run-time statistics

All methods are *sometimes* potentially confusing

Edge cases where number of rows wrong in execution plan XML

Actual Number of Rows for All Executions	42
Estimated Number of Rows Per Execution	1
Estimated Number of Rows for All Executions	1
Estimated Row Size	15 B
Estimated Data Size	15 B

  
Merge Join  
(Inner Join)  
Cost: 4 %  
0.031s  
42 of  
1 (4200%)

# Summary

## Percentages in the execution plan

### Cost percentages

Always based on estimates, not on actual cost

If cardinality estimates are wrong, cost percentages are unreliable

### Completion percentages

Number of rows really returned vs estimated number of rows

Measure of completion

Indication for wrong cardinality estimates

# Summary

## Block 1, basic level

Importance of execution plans

Ways to request an execution plan

Basics of reading execution plans

Properties

Finding execution plans that have already executed

Cardinality

Percentages

# Next chapters

Block 1: Understanding execution plans – advanced level

- Properties for the entire execution plan

- Properties found on (almost) all operators

- Ordering in the data stream

- Missing nodes

- Batch mode execution versus row mode execution

# Next chapters

Block 1: Understanding execution plans – advanced level

Block 2: Reading data – basic level

- Scans

- Seeks

- Lookups

- Special cases