

Understanding Basic Index Architecture and Index Usage



Gail Shaw

TECHNICAL LEAD

@SQLintheWild <http://sqlinthewild.co.za>



Agenda



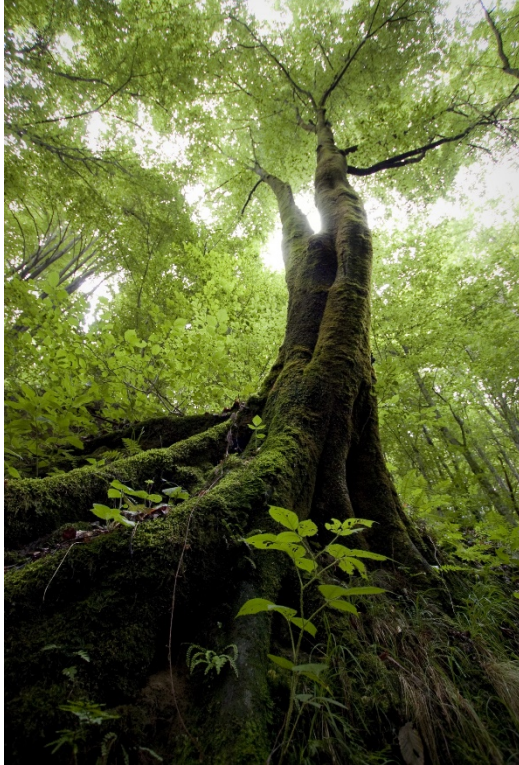
Index architecture

How SQL Server uses indexes

Reading index-related execution plan operators



Index Architecture



Data is stored in 8kb chunks, called pages

Organised into a tree structure

Data logically ordered by the index key



Index Architecture

A, 310.25
C, 301.01
A, 509.56
A, 89.20
B, 264.36
A, 469.12
C, 65.23
C, 186.36
B, 25.78
B, 358.78

A, 376.01
D, 248.32
D, 402.32
C, 207.56
C, 386.89
C, 264.36
C, 125.86
C, 374.44
D, 468.23
A, 264.36

D, 157.56
A, 205.41
B, 207.56
A, 197.25
C, 482.36
B, 286.35
B, 521.15
B, 142.31
A, 75.12
C, 375.12

D, 502.45
A, 15.89
A, 275.14
A, 325.65
B, 297.45
A, 105.14
A, 12.65
B, 472.36
C, 10.25
B, 251.14



Index Architecture

A, 12.65
A, 15.89
A, 75.12
A, 89.20
A, 105.14
A, 197.25
A, 205.41
A, 264.36
A, 275.14
A, 310.25

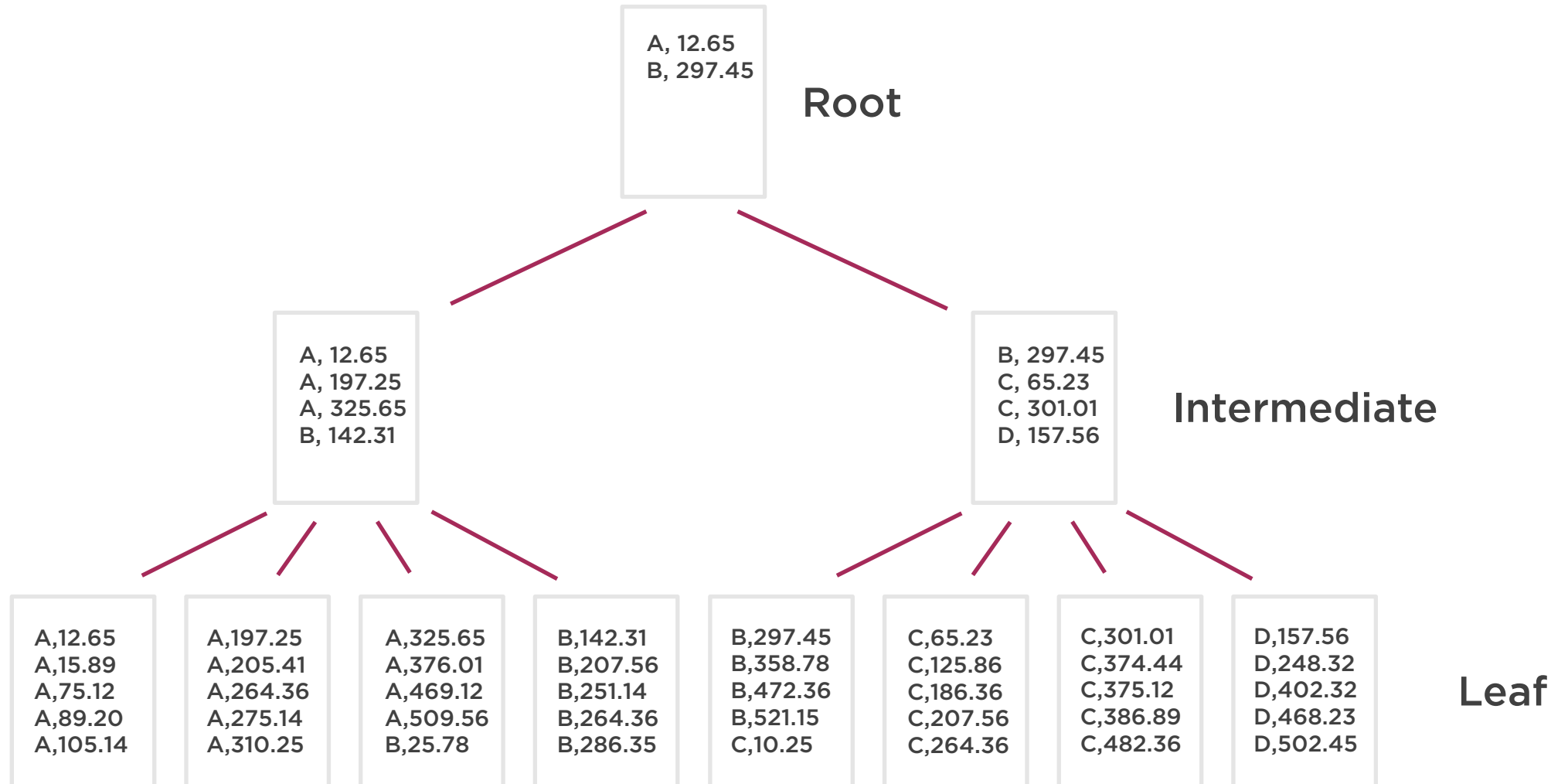
A, 325.65
A, 376.01
A, 469.12
A, 509.56
B, 25.78
B, 142.31
B, 207.56
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B, 264.36
B, 286.35

B, 297.45
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C, 10.25
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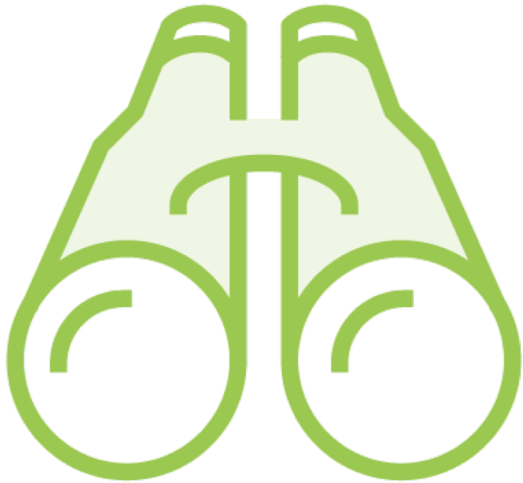
C, 301.01
C, 374.44
C, 375.12
C, 386.89
C, 482.36
D, 157.56
D, 248.32
D, 402.32
D, 468.23
D, 502.45



Index Tree Structure

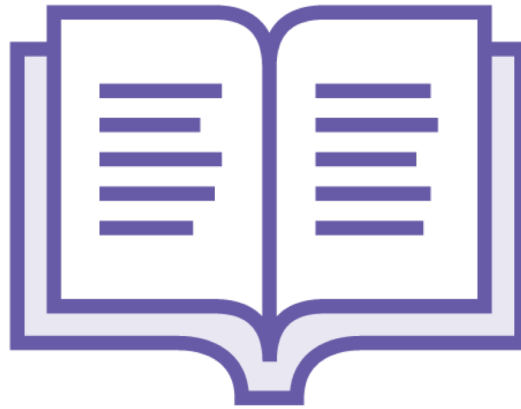


Index Operations in Execution Plans



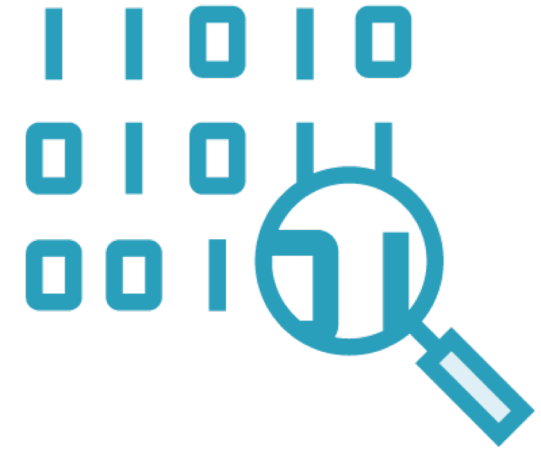
Index Seek

Navigation down the tree to find a value



Index Scan

Read some or all of the leaf pages



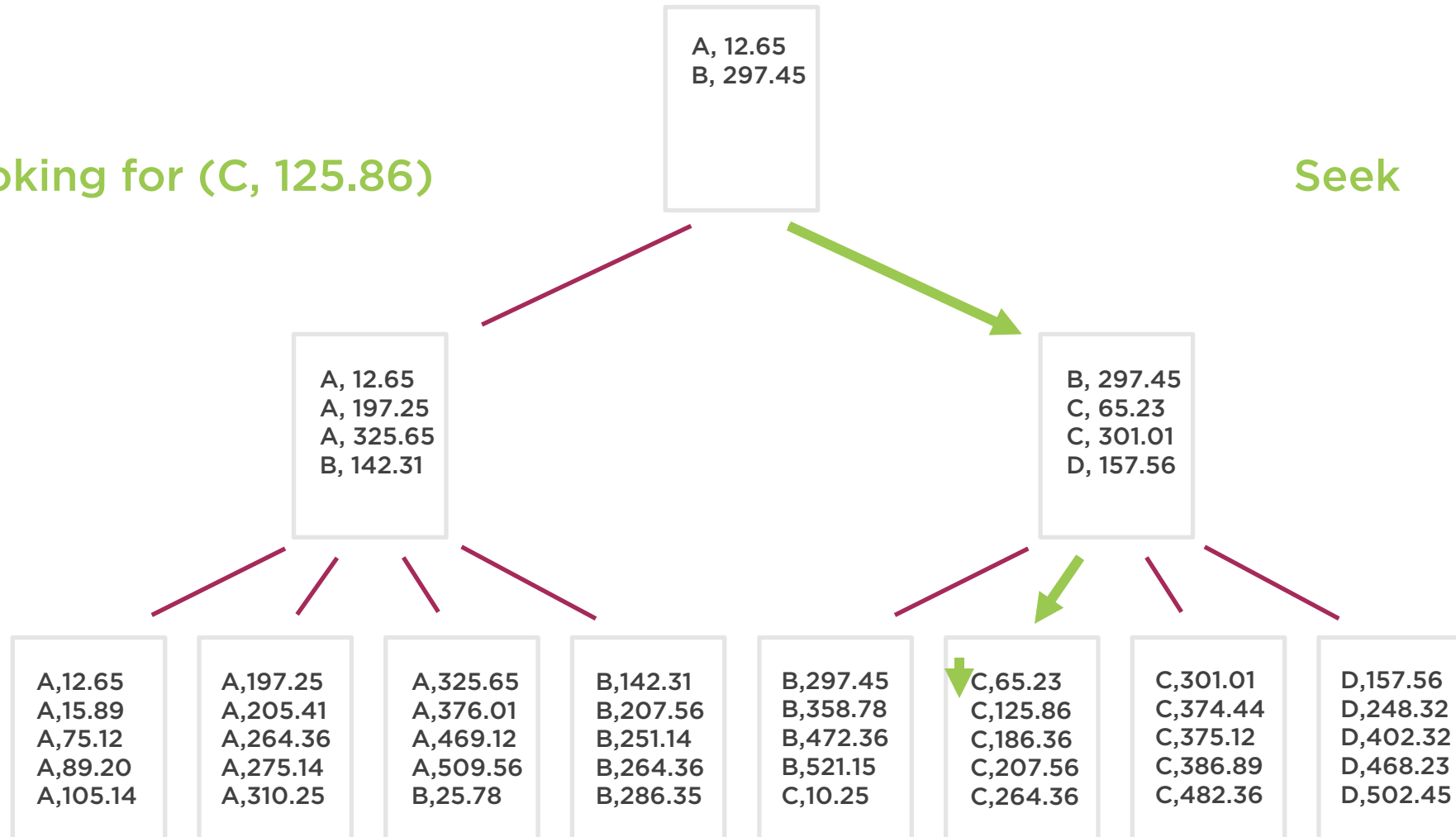
Key Lookup

Single-row seek to the clustered index

Using an Index

Looking for (C, 125.86)

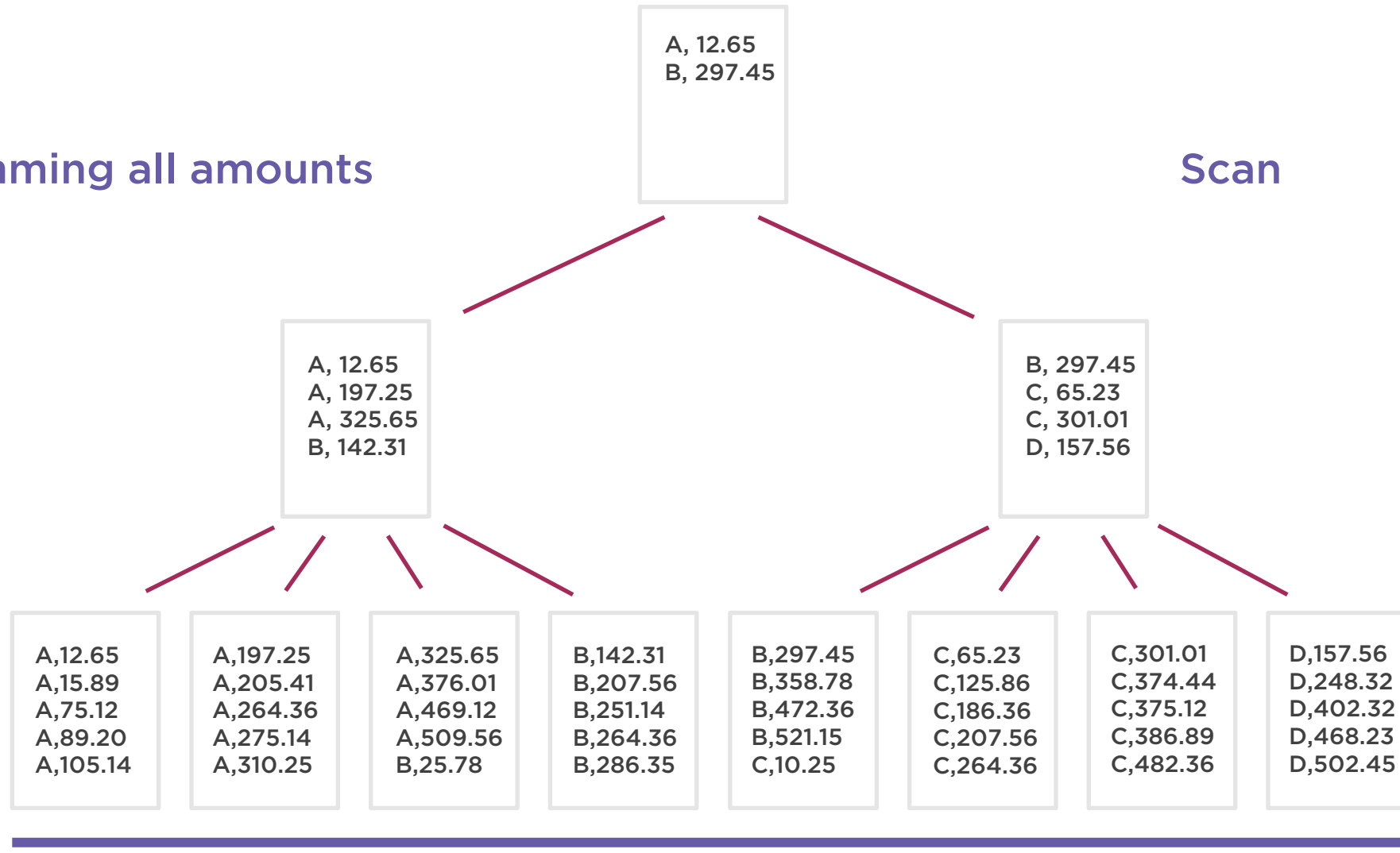
Seek



Using an Index

Summing all amounts

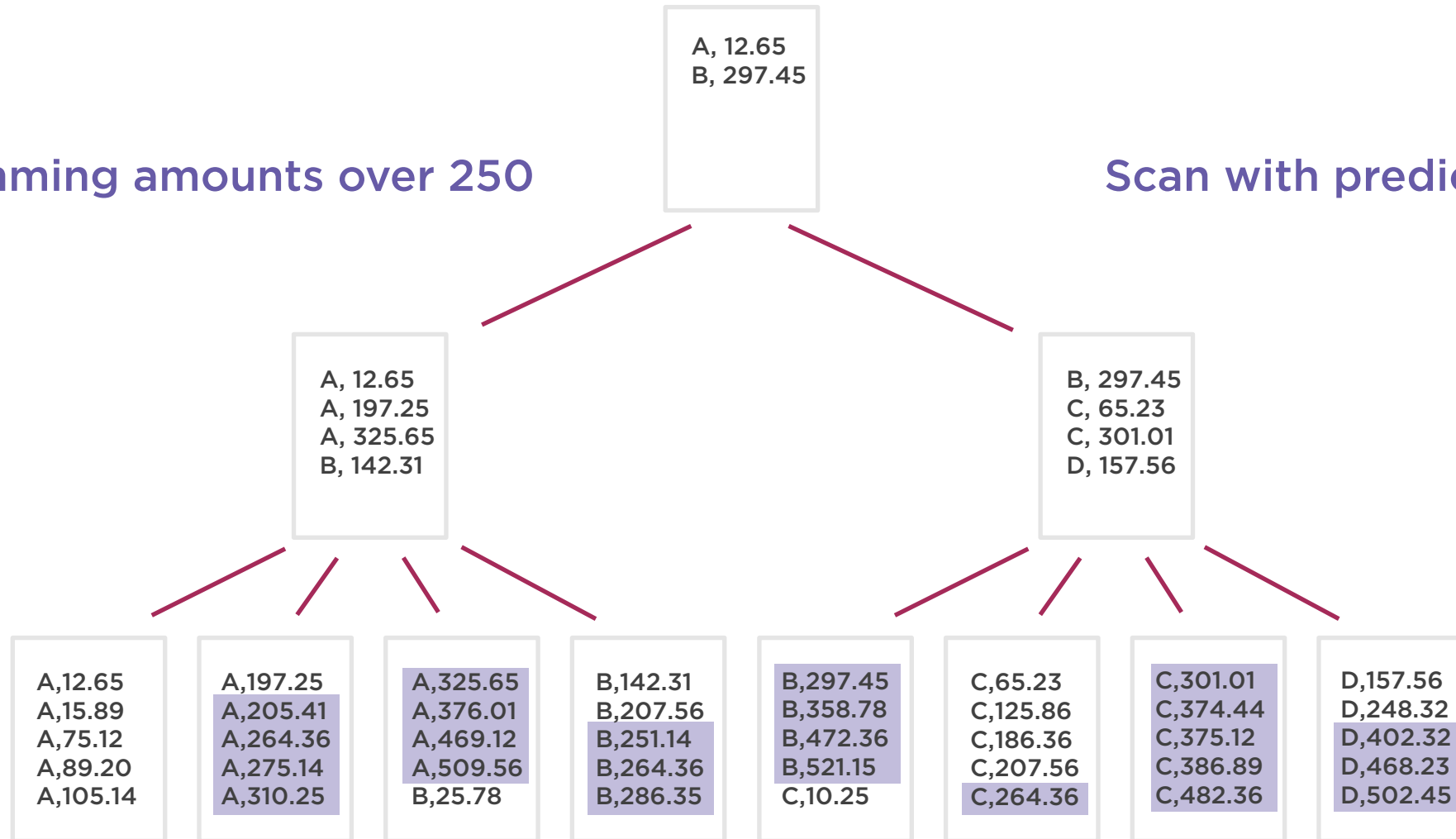
Scan



Using an Index

Summing amounts over 250

Scan with predicate



Demo



Index operations in Execution plans



Summary



Index architecture

Index usage

Index-related execution plan operators

